THE ENGINEERING AND MINING JOURNAL.

RICHARD P. ROTHWELL, C. E., M. E.
ROSSITER W. RAYMOND, Ph. D. } Editors.

NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. The articles written by Mr. Raymond will be signed with a star.

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THE FUEL OF THE FUTURE.

THERE is, probably, no branch of engineering skill, in which so little improvement has been made, and in which there is so wide and inviting a field for the exercise of ingenuity as in the utilization of fuel. Professor GRUNER, in a paper of which the following abstract was published in the ENGINEERING AND MINING JOURNAL, Vol. XXI., No. 8, states that—

"In the wind-furnace, which is, from this point of view, the most imperfect apparatus, there is utilized, in the fusion of steel in crucibles, but 1·7 of the total heat-capacity of the fuel, or at most 3 per cent. of the heat generated. In the reverberatory, when steel is melted in crucibles, the useful effect is 2 per cent. of the total heat, or 3 per cent. of the heat generated. In the Siemens crucible furnaces, 3 to 3·5 per cent.; in Siemens glass-furnaces, operating on a large scale, 5·50 to 6 per cent.; in ordinary glass-furnaces, 3 per cent.; in fusion upon the open hearth of a reverberatory, of glass, 7 per cent.; of iron, 8 per cent.; in well-arranged Siemens and Ponsard furnaces, up to 15, 18, and even 20 per cent. of the total heat is utilized.

"The caloric effect is much greater when the fuel is mixed with the material to be fused. In the old cupolas, 29 to 30 per cent., and in modern cupolas, higher, more rapid in working, and narrower in zone of fusion, upwards of 50 per cent. is realized. Large iron blast-furnaces utilize, according to their working, 70 to 80 per cent. of the heat generated, or 34 to 36 per cent. of the total heat which the complete combustion of the fuel would set free."

It is safe to assume that in ordinary steam engines where the steam is generated in plain cylinder boilers, the economy attained in the use of fuel is not much greater than in reverberatory furnaces, while in domestic use, in open grates especially, it is doubtful if as large a percentage of the heat capacity of the fuel is utilized. Yet though the extreme wastefulness of our methods of using fuel have long been subject of remark, no inventor has yet exploited with success, a field that offers a prize greater than the princely reward of the fortunate inventor of the Bessemer Process for making steel.

There are many causes which contribute to the enormous waste experienced in the consumption of fuel. Among the most important is the large amount of heat absorbed in the furnace itself, in the gasification of the carbon, that is, in the preparation of the fuel for combustion, and, further, in the fact that the quantity of nitrogen admitted with the atmospheric air necessary to furnish the oxygen for combustion is so great that it materially reduces the temperature of the furnace, and, as a consequence, reduces, in a still more rapid ratio, the effective work performed by the fuel.

In most metallurgical and engineering operations requiring the use of fuel, the chief aim is to obtain the highest possible temperature; it is, so to say, the last degree of temperature that does the work, and the economy may increase as some high power of the calorific intensity attained—limiting this always by the refractory qualities of the materials composing the furnace in which the combustion takes place. According to the statements of Prof. GRUNER, the gas furnaces of SIEMENS and others are among the least wasteful methods in the use of fuel; but even their system of gasifying the coal, as a preparation for burning, is far from satisfactory, for it introduces, in very large quantity, an element, nitrogen, that is not only non-combustible, but is a diluent which tends to reduce the temperature of the furnace, and to carry off quite a considerable amount of heat in its escape. The maximum of economy would naturally seem to be attained by admitting to the combustion chamber, fuel in a condition ready to burn, *i. e.*, in a gaseous form, and in the form of the gas, or gases possessing the highest temperature of combustion. Hydrogen and carbonic oxide seem to be the most available, and so generally has this fact been recognized, that for many years efforts have been made to manufacture these gases by the decomposition of water in contact with coal; these efforts have not, till recently, been successful in an economical sense. The reports we have published from time to time during the past year or two, recording the performances of the Lowe Gas Process, seem to place the matter of the economical manufacture on a large scale, of water-gas of a very high calorific value, among the settled questions. The extract from our contemporary, the Philadelphia *Polytechnic Review*, which will be found in another column, relates the success of the Manayunk works, where gas of a very high illuminating power is now being made.

It is not of illuminating gas, however, that we would now speak, but of heating gas, for we are convinced that the question of the economical production of a good heating gas once settled, the business of manufacturing it will greatly overshadow, by its enormous proportions, that of making illuminating gas. There is scarcely a use to which we now apply coal in our cities, that would not be benefited by the substitution of heating gas, if the price were sufficiently low. It is said that water-gas, manufactured according to the Lowe system, can be made at a cost not to exceed 15 cents per 1,000 cubic feet, a figure which should allow of its distribution, in the enormous quantities required for domestic and manufacturing purposes, at a very small price, say, 50 cents per 1,000 feet. The calorific value of this fuel calls for particular mention. Our correspondent, Mr. DWIGHT, in another column, makes a comparison with the well-known Siemens' gas, and shows a vast advantage for the water-gas. These figures are well worthy the attention of metallurgists and consumers of fuel, for if water gas, having more than four times the calorific value of Siemens' gas, can be produced here in the seaboard cities, where coal costs from four to five dollars a ton, by the Lowe or any other process, at a cost of 15 cents per 1,000 feet, it must be evident that a new era in the development of industry is dawning upon us. It is not too much to expect that, under these circumstances, gas would take the place of coal in most uses, its cleanliness, even if there were no great economy, would secure that result for domestic use, and the increased efficiency and convenience of gas, and the improved quality of the products obtained by its use, would be sufficient to secure its adoption for manufacturing and smelting purposes.

In this we have made no mention of the greater calorific intensity claimed for this fuel, though this is certainly one of the most important considerations in the case. In most metallurgical processes, an increase of 240° in the calorific intensity of this fuel over Siemens' gas would, we need scarcely say, be only less important than the economy estimated in the relative quantities required for equivalent results, as given by Mr. DWIGHT.

There is still so much to be learned with regard to the calorific intensities of fuels, that no mere paper estimate, however irreproachable its mathematics may be, can be accepted as settling the question. It is well known that disassociation of the combustible elements is effected at high temperatures, and that there are limits which vary for the different combustible gases, beyond which, under ordinary atmospheric pressure, combustion would be retarded or even prevented altogether. Thus, while the maximum hypothetical temperature of combustion of hydrogen under the atmospheric pressure is 2,684° C., it is improbable that hydrogen would combine with oxygen at temperatures much exceeding 2,000° C., for the disassociation of water into its elements takes place at about 2,500° C.

The maximum hypothetical calorific intensity of carbonic oxide, burning under atmospheric pressure, is 2,982° C., or greater than that of hydrogen, yet the greater calorific *power* of this latter, and the higher temperature at which it will unite with oxygen, give it a much greater economic value than carbonic oxide. The temperature of disassociation of carbonic acid into carbonic oxide and oxygen being from 1,000° to 1,200° C., calculations of furnace temperature, based only on the calorific intensity of carbonic oxide (2,980°), are subject to modification to a degree which can only be determined by actual experiment in the furnace. We simply point out those conditions which may modify not so much the figures given by Mr. DWIGHT as the inferences that may be drawn from them.

It is, of course, true, that these remarks apply with still greater force to Siemens' gas than to the water gas, for the large body of nitrogen is an injurious factor in many respects, and the 7 per cent. of carbonic acid, in the disassociation which it undergoes at ordinary furnace temperature, must abstract a very much greater amount of heat than would an equal quantity of air or of nitrogen.

The highest economy in the use of fuel consists in supplying to the furnace where the useful work has to be done, combustible gases only, and those which possess the highest calorific power, combined with a high calorific intensity. Since water-gas consists of but carbonic oxide and hydrogen (the gases into which all solid fuel is converted, by the absorption of heat, before it is burnt), it seems quite evident that this is as favorable a condition in which to use a fuel, as it is possible to obtain in the present state of our knowledge.

When we consider the question of the distribution of gas for fuel, for domestic purposes, the high calorific power of the gas becomes still more important than when it is manufactured directly at the works at which it is used. We confidently anticipate the introduction, before the lapse of many years, of heating gas for general domestic use; but though this will be attended with an enormous economy in the consumption of coal, we see nothing in it to injuriously affect the coal trade.

Experience has shown that every economy in the use of fuel has been followed by such a great and rapid development of the industries using coal, that the total consumption of this has increased, instead of diminished. If but half of the coal now consumed in this city were converted into heating-gas, at some central works, and distributed, as illuminating gas now is, it would more than do the work now done by the coal sold. But, with the great reduction in the cost, and facility in the use of heat, it would quickly be employed in a multitude of ways not now thought of; and not only the cooking and heating would be done

by gas, but much of the work done by our servants would be performed by machinery; manufacturing of all kinds, and, particularly, those small industries that can be carried on in private houses, would multiply to an unheard-of extent. Our mills and machine shops, factories and furnaces, able to save enormously in their fuel item, would find wider markets for their products, and in a thousand other ways the consumption of fuel would be so greatly increased that the demands for coal would be fully maintained, and would soon assume proportions exceeding the most extravagant views of our most sanguine "coal men." So mote it be.

PROPOSED INTERNATIONAL GEOLOGICAL CONGRESS.

THE activity which has prevailed in the study of geology within the past generation has given to it a great importance both in a scientific and an economic point of view, and has resulted in a large accumulation of facts and materials. Workers in different countries have, however, pursued their labors, to a great extent, independently of each other, and have given their results in such ways that it is often difficult to coördinate them. Those geologists from Europe and America who have been at the International Exhibition at Philadelphia in 1876, have found there important collections of geological maps and sections, with rocks and organic remains from various regions of North and South America, as well as from many countries of Europe, and they have become deeply impressed with the great advantages to be gained by their comparative study. It was, moreover, evident that the bringing together of a still larger number of such collections, in accordance with a previously arranged plan, could not fail to lead to important results for geological science. The International Exhibition to be held at Paris in 1878 will furnish such an occasion, and it is proposed to invite to that end governmental geological surveys, learned societies, and private individuals throughout the world, to send to Paris such collections as will make the geological department of that exhibition as complete as possible.

In order to take advantage of the collections which may thus be brought together, it is, moreover, proposed to convoke an International Geological Congress, to be held at Paris at some time during the Exhibition of 1878, and to make that Congress an occasion for settling many disputed problems in Geology.

In accordance with this plan it is proposed that the Geological department of the International Exhibition of 1878 shall embrace:

I. Collections of crystalline rocks, both crystalline schists and massive or eruptive rocks, including the so-called contact-formations and the results of the local alteration of uncrystalline sediments by eruptive masses. In this connection are to be desired all examples of organic remains found in crystalline rocks, including eozoon and related forms. These collections should, moreover, comprehend all rare and unusual rocks of special lithological, mineralogical and chemical interest, examples of ore-deposits and of veinstones of all kinds, with their encasing rocks. As far as possible these collections should be limited to specimens of a size convenient for examination, and be accompanied with sections prepared for microscopic study. In the arrangement of all these materials regard should be had to their natural associations rather than to theoretical notions or artificial classifications, so that they may be studied not only petrographically but geognostically.

II. Collections illustrating the fauna and the flora of the paleozoic and more recent periods, particularly of such horizons as present a more critical interest to paleontologists from the first appearance or the disappearance of important groups of organic forms. It has appeared to the Committee named below that the organic remains of the Cambrian, Taconic, or so-called Primordial strata, merit especial attention in this connection.

These various collections should be explained as fully as possible by labels, catalogues, monographs, and maps.

III. Collections of geological maps, and also of sections and models, especially such as serve to illustrate the laws of mountain structure. In the geological maps regard should be had to various questions which deserve the special consideration of the Congress, such as the scales best adapted for different purposes, the colors and symbols to be used, and the proper mode of representing superficial deposits conjointly with the underlying formations. A discussion of these will prepare the way for improved general geological maps of the continents.

In pursuance of the above plan the AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, during its annual meeting at Buffalo, under the presidence of Prof. WILLIAM B. ROGERS, unanimously adopted the following resolution on the 25th of August, 1876.

Resolved, That a Committee of the Association be appointed by the Chair to consider the propriety of holding an International Congress of Geologists at Paris, during the International Exhibition in 1878, for the purpose of getting together comparative collections, maps and sections, and for the settling of many obscure points relating to geological classification and nomenclature. And that to this Committee be added our guests, Prof. T. H. HUXLEY of England, Dr. OTTO TORELL of Sweden, and Dr. E. H. VON BAUMHAUER of the Netherlands, who shall be requested to open negotiations in Europe looking to a full representation of European geologists at the proposed Congress. The said Committee to consist of Prof. WILLIAM B. ROGERS, Messrs. JAMES HALL, J. W. DAWSON, J. S. NEWBERRY, T. STERRY HUNT, C. H. HITCHCOCK, and R. PUMPELLY in behalf of the Association, with the addition of Prof. T. H. HUXLEY, Dr. OTTO TORELL and Dr. E. H. VON BAUMHAUER.

On the same day, at a meeting of the Committee, Prof. JAMES HALL was elected Chairman, and Dr. T. STERRY HUNT, Secretary. It was then resolved to prepare the present circular, to be printed in English, French, and German, and distributed to geologists throughout the world, asking their coöperation in this great work of an International Geological Exhibition and an International Geological Congress, to be held at Paris in 1878; the precise date of the Congress to be subsequently fixed.

All those interested in this project are invited to communicate with any one of the following members of the Committee:—

Prof. T. H HUXLEY, London, England,
Dr. OTTO TORELL, Stockholm, Sweden,
Dr. E. H. VON BAUMHAUER, Haarlem, Holland,
Dr. T. STERRY HUNT, Boston, Mass., U. S. A.

BOSTON, MASSACHUSETTS, Sept., 1876.

NEW ALMADEN QUICKSILVER WORKS.

CORRECTION.

A CORRESPONDENT sends us the following correction:

"In the JOURNAL of August 19, page 118, Mr. W. S. KEYES, in an account of quicksilver deposits at Borax Lake, says:

"'The richer specimens of ore and residues are put in retorts with lime, as is commonly practiced at New Almaden.'

"For the truth of history, please state retorts *are not* used at New Almaden, nor have they been in use there within fifteen years."

AMERICAN INSTITUTE OF MINING ENGINEERS.

October Meeting.

OFFICIAL REPORT.

THE Institute assembled on Tuesday evening, October 24th, in the hall of the Franklin Institute, Philadelphia. Mr. FRANK FIRMSTONE, of the Glendon Iron Works, called the meeting to order, and called on Mr. J. PRICE WETHERILL, of Tremont, Pa., for a paper on "An Outline of Anthracite Coal Mining in Schuylkill County, Pa." The paper was discussed by Messrs. COXE, ROTHWELL, HEINRICH, HARDEN, and SYMONS.

The second session was held on Thursday evening.

Mr. A. L. HOLLEY, Chairman of the International Committee, appointed by the Institute to consider the nomenclature of iron and steel, offered the report of the Committee signed by all the members. (This report was published in the ENGINEERING AND MINING JOURNAL of last week.) Mr. WILLIAM METCALF, of Pittsburg, then read a paper entitled, "Can the present Commercial Nomenclature of Iron and Steel be reconciled to a Scientific Definition of the Terms used to Distinguish the various Classes?" The subject was then discussed by Messrs. HOLLEY, RAYMOND, HOWE, and others. On motion of Mr. RAYMOND the report was accepted and further action on it delayed until the next meeting of the Institute. Mr. R. P. ROTHWELL read a paper on the "Coal Production of the United States."

Mr. A. L. HOLLEY offered the following resolution, which was unanimously adopted:

Whereas, The novel, wise, and useful design of the Centennial Commission of this Institute, and its most judicious and faithful execution—in opening rooms in the city of Philadelphia, in furnishing them with a large and instructive collection of maps and publications; in organizing weekly conversaziones; in extending courtesies to all engineers; in furnishing information concerning localities, routes, and works, to foreign guests; in bringing together inquirers from all parts of the world; and the makers, managers, and owners of American machinery, and engineering and metallurgical works—have been so conspicuously useful and agreeable to our foreign professional brethren especially, as to call forth from them a universal expression of gratitude, and a general determination to follow the example of the Commission on similar occasions, in their own countries;

And, whereas, The co-operation and courtesy, during the period of the Centennial Exhibition, of the Centennial Commission of the American Society of Civil Engineers, and of the members of that Society at large, with our own Centennial Commission, and with the members of this Institute at large, has not only facilitated the accomplishment of the results referred to, but has led to a wide acquaintance, and promoted the growth of a kindly feeling between the members of the two societies; therefore,

Resolved, That the sincere thanks and hearty congratulations of the Institute are tendered to its Centennial Commission, for its valuable services to the guests of the Institute, and to the Institute itself, in promoting its objects and extending its influence;

Resolved, That the thanks of the Institute are especially due to the Secretary of the Centennial Commission, Mr. WM. G. NEILSON for his most thoughtful, courteous, and laborious services to its guests and members;

Resolved, That the Institute tenders its congratulations to the Centennial Commission of the American Society of Civil Engineers, not only with regard to the success of the work in which the two societies have co-operated, but in the belief that the acquaintance and good feeling developed during their agreeable labors, will permanently establish such harmonious relations, and, from time to time, lead to such farther co-operation as will, in a still greater degree, benefit the two societies and the profession at large.

The third session was held on Thursday morning, when the following papers were read:

"On the Volumetric Determination of Sulphur and Ammonia in Illuminating Gas," with a description of the apparatus employed, by Mr. H. E. SADLER, and Prof. B. SILLIMAN.

"On a Plan for a Mining School in Japan," by Prof. H. S. MUNROE.

"On the Effect of the Increased Height of Blast Furnaces," by Mr. H. M. HOWE.

Mr. THOMAS WHITWELL, of Stockton-on-Tees, England, in the discussion following Mr. HOWE'S paper, spoke of the effect of "super-heated" blast.

Mr. R. W. RAYMOND, on behalf of the Centennial Committee, made the following statement and report of progress:

It is scarcely necessary to inform members of the Institute that the plan adopted by the Centennial Committee has been executed with a highly satisfactory degree of success. The headquarters in Girard Street, Philadelphia, have been kept open, daily and nightly, for the reception of members and guests, a large number of whom have registered their names and made frequent use of the facilities offered by the Committee. The extent to which the rooms have served as a gathering-place for American and foreign engineers may be inferred from the following analysis of the names recorded. It should be remarked, however, that the actual number of gentlemen visiting the rooms is larger than the registry indicates, since many have been present on various occasions who have not left their names. This is particularly the case with the attendants at the Thursday *Conversaziones*, on which occasions the rooms have often been crowded.

The registry, up to October 25, is as follows:

Nationality.	Number.	Nationality.	Number.
United States	377	Switzerland	2
Germany	43	Italy	2
France	20	South America	2
England	19	Siberia	2
Austria	19	New Zealand	1
Sweden	19	Portugal	1
Belgium	15	Norway	1
Canada	13	Mexico	1
Russia	7	Cuba	1
Spain	4	Poland	1
Australia	3		
Netherlands	3	Total registry	556

The extent to which foreign engineers have been assisted in their examination of the resources and industries, mines and works of the country by the agency of the Centennial Committee may be partially inferred from the statistics of correspondence. The copy-books of the Headquarters show, besides 432 general letters, no less than 394 letters of introduction, given mostly to foreign guests, and addressed to members in all parts of the country. In addition to these, many letters of a similar character have been written by members of the Committee and others, but not recorded at the Headquarters. It is a moderate estimate to say that more than 500 such written introductions and recommendations (to say nothing of the innumerable personal introductions taking place at the rooms) have been furnished through the agency of the Institute and its Committee, and particularly through the very efficient activity of Mr. NEILSON, the Secretary. The Committee desires to bear witness also to the extremely cordial reception everywhere encountered by the bearers of such rec-

ommendations. The unanimous testimony of our foreign guests amply confirms this declaration. Besides letters, Mr. NEILSON has furnished, to individuals and parties, 41 complete route-schedules, including all the directions and information needed by strangers traveling for the first time in the United States. Some of these parties have made very extensive tours, embracing even the distant regions of the Pacific Coast, and they report that the advice and assistance thus furnished to them have been of the greatest use in securing economy of time and completeness of satisfaction and comfort.

Every Thursday evening throughout the season has been devoted to an informal meeting or *Conversazione;* and on every such occasion, with a single exception, there has been, in addition to the social interchange of opinion, an address or familiar talk, usually followed by a discussion, upon some interesting topic of mining, civil, or metallurgical engineering. At the next meeting of the Institute, when the Centennial Committee will make its final report, a list of these topics will be included. For the present, it is sufficient to refer members to the files of the ENGINEERING AND MINING JOURNAL, in which the *Conversazioni* have been briefly reported. The Committee desires, however, on this occasion, to acknowledge with thanks the cordial co-operation of the Centennial Commission and private members of the American Society of Civil Engineers, whose presence and contributions have done much to enhance the attractiveness of our rooms and the interest and pleasure of our social gatherings. The harmonious operation of the two societies, and the happy arrangement by which our members were invited to make use of the Headquarters of the Civil Engineers in the Centennial Exhibition (this courtesy being reciprocated by us at our Headquarters in the city), have secured for all, the advantages of both plans. Your Committee recognized as I had the honor, speaking in its name, at the Cleveland meeting, to declare, that certain arguments undoubtedly favored the establishment of a Headquarters for the Institute within the Centennial grounds, yet it was moved by many considerations, which experience has now justified, to choose a different plan. We owe it to the friendly courtesy of the Civil Engineers that our own scheme has been amply successful, while we have not lost thereby even the benefits which we feared its adoption would necessarily sacrifice; yet the Committee is assured that the advantages of this arrangement have been mutual, so that the sense of cordial alliance and common success, rather than of obligation on either side, characterizes the present relations of the American Society of Civil Engineers and the American Institute of Mining Engineers.

The response of the professional gentlemen, for whose convenience the plan of your Committee was largely designed, has been enthusiastic and flattering, and at last, proceeding from words to deeds, it has taken a form unexpected to the Committee and almost overwhelming. The first manifestation of the kind was a communication from the Imperial German government thanking the Institute for the courtesy and assistance tendered to its engineers, and presenting, as a testimony of its appreciation, the splendid collective exhibits of the German silver and lead works and the salt mines, now in the Centennial Exhibition, together with a valuable series of maps and publications. This magnificent gift has been followed by the offer of the exhibits of ores from Switzerland; of the Luxemburg Mine and the Saarbrücken Furnace Company; of the Fagusta collection of Swedish irons and steels, including the famous samples covered by the Kirkaldy tests and of the exhibits of a considerable number of American mining and metallurgical companies. Intimation has also been made to the Committee that portions, of the exhibits of Austria, Mexico, Portugal, Spain, Queensland, Victoria, and South Australia are ready for the acceptance of the Institute.

The Centennial Committee, surprised by the first of these donations, and forced by circumstances—which it is not necessary to give on this occasion in detail—to take immediate action, would have been compelled to decline all gifts of this kind, but for the timely offer of the Trustees of the Pennsylvania Museum and School of Industrial Art to set apart a suitable room in Memorial Hall (which is to be permanently occupied by that institution) for the reception and installation of the collections given to the Institute of Mining Engineers, and to assume the care of that apartment without cost to the Institute, for such a period as the collections should be permitted to remain, the ownership and control of the Institute over them to be unimpaired.

This offer the Centennial Committee provisionally accepted; and this acceptance, together with that of the collections tendered, has been reported to the Council, and will doubtless be brought before the Institute for ratification. Your Committee considers this arrangement as most fortunate, and trusts that it will be approved by the Institute.

With reference to the receipts, assets, and expenditures connected with the Centennial Headquarters, the Committee considers itself responsible to the subscribers to its special fund; but, as a matter of general interest to a large number of members, begs to say briefly that the amount subscribed and collected, is about $4,000, and that this sum, together with the proceeds of the assets on hand at the rooms, will suffice to cover all expenses hitherto incurred or now foreseen. But many members have expressed the strong desire that the books, maps, and pictures collected at the rooms should remain the property of the Institute. To effect that end, a further sum of about $250 will be required; and if this is contributed by members, the committee will take pleasure in transferring to the Institute the valuable library and collection now at the rooms. Subscriptions for the purpose may be sent to Mr. NEILSON. I will add, that it seems not only a pity but a shame to scatter this collection; since many books and publications, though solicited and obtained by the Committee, for the rooms specially, were undoubtedly expected by the donors to become permanently the property of the Institute. Your Committee does not doubt that the funds necessary to preserve them will be easily collected.

Mr. FIRMSTONE, Vice-President, then offered, on behalf of the Council of the Institute, the following resolution:

Resolved, That the Institute accepts the collections and publications presented to it as reported hitherto, and the Council is authorized to accept in its discretion, such as may hereafter be presented, and to conclude the provisional arrangement pending with the Pennsylvania Museum and School of Industrial Art, for the installation of the said collections, and to do whatever else is necessary in the premises, Provided that the right of property and control of the Institute over these collections shall not be impaired, and that the Institute shall not be involved in pecuniary obligations, or in payments from the fund consisting of members' fees, and the proceeds of the sale of Transactions.

Resolved, That the thanks of the Institute be tendered to the generous donors of collections and publications, and to the Trustees of the Pennsylvania Museum and School of Industrial Art.

After discussion by Messrs. PEARSE, FRAZER, and RAYMOND, the resolution was unanimously adopted.

The fourth and concluding session of the Institute was held on Thursday afternoon. Mr. A. L. HOLLEY read a paper by Mr. C. M. RYDER, of the Otis Iron and Steel Works, Cleveland, on the "Determination of Carbon by Magnetic Tests."

The following persons, having been duly proposed and endorsed by the Council, were then elected members, or associates, of the Institute:

HONORARY MEMBER.

Richard Akerman, Stockholm, Sweden.

MEMBERS.

John Bogart, Civil Engineer, American Society of Civil Engineers, 4 East 23d Street, New York City.
Fred. Everett Bruen, E. M., Essex Public Road Board, Newark, N. J.
Robert Bunsen, M. E., Assayer and Chemist, Boyd's Smelting Works, Boulder, Col.
W. E. C. Eustis, Mining Engineer, Readville, Mass.
Fred. M. Gordon, Mechanical Engineer, Ironton, Lawrence County, Ohio.
George N. Gray, Ironmaster, Huntington, Cabell County, W. Va.
William G. Hamilton, Civil and Metallurgical Engineer, 30 Broadway, New York City.
James Amory Heorick, Superintendent Steel Department, Nashua, N. H.
R. F. Hoke, Raleigh, N. C.
Joseph L. Hunter, Mechanical Engineer, 426 Walnut Street, Philadelphia.
William Kent, M.E. Stevens Institute, Hoboken, N. J.
Gabriel Leverich, Secretary American Society Civil Engineers, 4 East 23d Street, New York City.
Oliver Matthews, B.M.E. Bessemer Steel Works, Bridgeport, Chicago, Ill.
F. H. Oliphant, Jr., Superintendent Mercer Mining and Manufacturing Company, Hardee, Mercer County, Pa.
John N. Pott, Assistant Mining Engineer, Tremont, Schuylkill County, Pa.
F. B. F. Rhodes, Mining Engineer, Drifton, Jeddo, Luzerne County, Pa.
Charles M. Ryder, Metallurgical Engineer, Otis Iron and Steel Works, Cleveland, Ohio.
General Samuel Thomas, General Manager Columbus Rolling Mill Company, Columbus, Ohio.
John Fraser Torrance, Mining Engineer, Montreal, Canada.
Edwin A. Wetmore, E M., Marquette, Mich.
George T. Wickes, Civil and Mining Engineer, Lowmoor Mines, Selma, Allegheny County, Va.
Ed. H. Williams, Jr., Mining Engineer, Drifton, Jeddo, Luzerne County, Pa.
John I. Williams, General Superintendent Graff, Bennett & Co.'s Works, Pittsburg, Pa.
Dr. Otto Wuth, Chemist, Pittsburg, Pa.

ASSOCIATES.

Benjamin F. Chyroweth, Rockland, Mich.
James S. Mackintosh, 55 Garden Street, Hoboken, N. J.
Frederick N. Owen, Nyack, Rockland County, N. Y.
Nelson W. Perry, School of Mines New York City.
Holmes E. Sadler, New Haven, Conn.
Milton S. Thompson, Islip, L. I., New York.
F. Von Cabeen, 201 Walnut Street, Philadelphia.

FOREIGN MEMBERS.

Lucien Arbel, Senateur, Rive de Gier, Loire, France.
T. Fayen, Liege, Belgium.
Adolphe Henry, Rive de Gier, Loire, France.
Prof. Hans Höfer, Klagenfust, Austria.
Prof. Nicholas Jossa, St. Petersburg, Russia.
Ferdinand Valton, Rue Lepeletier, 20, Paris, France.

Mr. R. W. RAYMOND made two short communications on the Production of Bessemer Steel and Petroleum in California.

Mr. H. M. HOWE offered the following resolution:

Resolved, That the hearty thanks of the American Institute of Mining Engineers are hereby offered to the Management of the Franklin Institute for its courtesy in placing the hall at the disposition of the Institute for the present meeting.

The following papers were then read by title:
"The Lignite Coals of Colorado," by Prof. W. B. POTTER, of St. Louis, Mo.
"The Mineral Industry of Russia," by Mr. R. W. RAYMOND.
The Institute then adjourned.

WHITWELL'S HOT-BLAST OVENS.

TO THE EDITOR—SIR: In your number of August 19, page 119, in an interesting paper by JAMES E. MILLS, B. S., I see the remark made that "The disadvantages of stoves of this class* are, large first cost, considerable complication of parts, and great care required in the management of them. Now, sir, these are charges which are serious, and I will deal with them in order.

FIRST.—LARGE FIRST COST.

I may say that in Ironton they chose, without reference to me, to put in your splendid 60,000 lb. boiler plate, an absurd and sinful waste. *We* use only common tank quality, at £7 5s. per ton, equal, for a similar quality with you, to three cents per lb., and this is quite good enough; and by this means, and using bricks that are also good enough, the cost in England, per stove, of 15 feet diameter, is £575 each; 18 feet, £767; 22 feet, £975. Three to one furnace are quite enough, and allowing for the difference in cost, at, say 50 per cent. additional, the cost with you, per furnace, is no more than with cast iron stoves, warranted to burn out.

SECOND.—CONSIDERABLE COMPLICATION OF PARTS.

Anything simpler than the WHITWELL hot blast is hard to conceive, especially as there are no pipes to crack, and then "clam and patch," no joints to leak; but all is air-tight, thus saving repairs to a wonderful extent. Consett first set of WHITWELL's ovens is now out after a blast of six years and three-quarters; not one hundred and thirty-seven days, like Mr. MILL's stove. These Consett stoves made, in one blast, 175,230 tons, and now they are lining the furnace No. 4, and will blow in again on the same stoves for another blast of 175,000 tons, or more.

The Consett Company have six furnaces, making 26,000 tons each, per year, with twenty-four WHITWELL hot blasts; this speaks for itself. The world has 369 of my hot blasts, in blast or building.

Now, sir, as far as we can see, one of my ovens has twenty years' life, or 5 per cent. depreciation. I have burned down, betwen 1862 and 1874, one set of Staffordshire Marten ovens to three furnaces, one complete set of Linthorpe, or model, pipe ovens, and one complete set of PLAYER's ovens, and only he who has been fighting all his life with pipe hot blasts can appreciate the comfort of three furnaces on fire brick ovens; one stove-minder at 4s. 6d. a day manages the ovens for three furnaces.

*The WHITWELL Type.

Now, my experience, and that of almost every other furnace engineer, shows that if his hot blasts cost, at first, £3,000, he loses at the average rate in removals of £1,000, or 33 per cent. per annum. When a pipe oven is off, it is rarely off less than five weeks; the other ovens are getting dirty, the coke with colder blast goes up a barrow a round; the stockholders know nothing about it, but till the oven is repaired the manager dares not stop to clean his other ovens, and the blast gets cooler daily; the make being reduced from 500 tons to 400 tons per week means increased labor, and works charges; these two items rise to 2s. 6d. on the ton of iron, or, for five weeks at the Consett rate, a loss of 400 tons×5 = 2,000 tons at 2s. 6d. = £250 for one oven.

Increased coke, owing to the blast being 200° cooler, on a Pennsylvania or other furnace using coke, say 3 cwt. fuel at 9d. per cwt. on 400 tons per week, for five weeks, equals £225, and with the previous amount of £250, makes £475. This is much within the mark, and the books at the end of the year would show it, if any one thought of searching for it. But, sometimes, owing to the oven-minder smoking his pipe, or going to sleep, or what several times happened on the night shift, putting the gas on an oven after casting, opening the cold blast valve, and forgetting to open the hot blast valve, the result was that half the stove pipes were blown out of shape, and cracked; and you must add to the aforesaid £475, £150 for new hot blast pipes, making, with men's time and bricklayers' labor, a total loss in repairing one oven of £700, besides a diminished make of 500 tons. This occurs in the third or fourth year so often, that in the end the ovens must be entirely reconstructed, or the furnace must blow out, and the stockholders merely see not only no profit made, but a heavy loss incurred.

Now, the depreciation and repairs, instead of being some thousands of pounds a year as with the pipe oven, are, on my system, brought down to under £100 per year per furnace, and business men, except in America, have been sharp enough to discover it long ago, so that now £600,000 is invested in my hot blasts alone.

Complication indeed! Why, sir, every man has a complicated machine called a watch, but it goes, though not one in fifty thousand knows the construction of the machine he carries for years.

The third charge is—

GREAT CARE REQUIRED IN THE MANAGEMENT OF THEM.

Now, sir, I pay one man 4s. 6d. per day to manage all the stoves for two blast furnaces. Does this prove the accusation? So little care is necessary, that if a man smokes for three or four hours, without the boss finding it out, the stove is no worse. I pay the man and he keeps a regular heat to suit the slag, changing the stove once an hour.

Then as to practice. Our hands struck on Saturday, August 26th, last, to compel us to give an advance from 4s. 2d. to 4s. 4d. for mine fillers, and 1d. per day for top chargers. Every man went off the ground, without notice, except the managers, who, with one keeper and night foreman, tapped out the metal, took down the "bags," and by midnight had made all snug.

On Monday we paid off one shift, and the following Wednesday the second shift were paid off entirely, *i.e.*, chargers, keepers, slaggers, mine fillers, and coke fillers.

The furnaces, without preparation, stopped dead, and we got about two feet of solid iron and slag set down on the bottoms. A nice thing, as any furnace manager would say. Well, on Wednesday we got down our dams and drilled through to the top of the metal, and by means of navvies, and one molder, started No. 3 furnace, the head furnace manager charging her all night on the top himself.

Refusing to discharge a new hand, on any account, we told the men some of them would not start again. By means of the boiler-smiths we drilled in behind the dams of Nos. 2 and 1 furnaces to the soft, and at last, on a posse of men coming up from Eston and Southbank, under fear of losing all their places, the men came in, and we started a few on Friday at No. 2, and on Saturday at No. 1 furnace, after a solid stand of 14 shifts.

Well, sir, as they were all WHITWELL's Hot Blasts, of course the ovens, after 14 shifts' stand, were all red hot yet, and we blew in on hot blast and had foundry iron the first cast on each furnace, and now, after another week's running, with heats at 1,450°, we are in full work, the bottoms melted up and making nearly full makes with our old burdens.

Well, sir, this is the good of *Hot Blast*, both in starting after the strike, with *Hot Stoves*, and also keeping plenty of gas for boilers at the start.

Mr. BELL talks of 920°. Sir, this is theory. Mr. BELL's own manager *practices* 1,100°. No manager runs on 920° if he can get more, and no furnace works *theoretically* long together—because all accidents tend to chill a furnace: a strike, a leaky tuyere, snow, wet coke or mine, bad heats, and a dozen other causes, chill a furnace, and then more coke is Mr. BELL's remedy, instead of good hot blast, which *costs nothing*.

I trust, sir, that most unprejudiced readers will agree that these *serious* charges are, after all, only wind, and that in result, without egotism, no furnace stockholder, president, or manager, could adopt a better system than "tear down" his old cast iron ovens and put up something which time has proved to be best every way, in spite of all Mr. BELL's theories.

October 7th, 1876. THOMAS WHITWELL.

ORE CRUSHING MACHINERY AT THE PHILADELPHIA EXHIBITION.

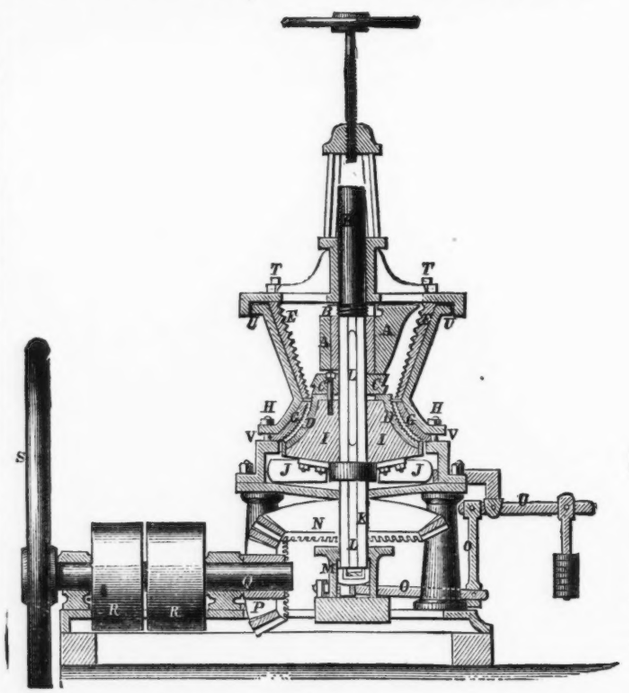
Special Report of the Engineering and Mining Journal.

BAUGH'S SECTIONAL MILLS.

THESE machines are made to perform a double function, acting, if necessary, both as crushers and pulverizers. They differ from the KROM machines in working by attrition, instead of compression. The construction can be understood by examining Fig. 2, which gives a sectional view of the mill.

The mortar, or grinding, tub, consists of two hollow frustums of cones, placed with three smaller bases together. Passing down through the center of the mortar is a vertical shaft L L, which carries a chilled iron breaker A A. This breaker, by its revolution, coarsely crushes whatever is too large to pass between it and the corrugated chilled iron linings E E, of the mortar. The piece C C, is another roughened breaker of chilled iron, which crushes still further what has passed down through the upper part of the mortar. Below the piece C C, is an iron cone, I I, which is held in place on the shaft by the feathers L L, and a collar underneath. The cone is lined with roughened plates D D, made of chilled iron, which are held in place by a wrought iron ring shrunk on the lower part of the cone, and also by the screws passing down through the piece C C. These plates D D, are roughened differently for pulverizing different kinds of materials. Eight of them are used on each cone, and the same number are used on the opposite surfaces of the mill at G G. The distance between the surfaces D D and G G, is regulated by means of screws, which prevent the lever O O from rising above a certain adjustable point. The shaft rests on a step box at M, which, in turn, rests on the end of the lever O, so that in case any extraordinary strain is brought to bear on the mill, the shaft will be forced down so as to widen the space between G G and D D. The end of the shaft is made of steel, and is flat. It does not rest directly on the step box, but there is interposed a flat double cone of hardened steel, one apex of which supports the shaft, while the other rests on the bottom of the step box, which also has to be made of hardened steel. Power is communicated to the shaft through the bevel gears P and N. The linings E E, G G, and D D, being in sectional pieces, can be easily removed either in whole or in part, when they become too much worn for further use. The screws, J J, when loosened, permit the top to be taken off, so that A A, C C, and E E can be removed. To get at the plates G G, and D D, the bolts H H are taken out, and the whole of the mortar can then be raised. The lifting of these parts is accomplished by screwing down the large screw on the top of the machine, which, by its pressure against the top of the shaft, raises the mortar, or the mortar top, as desired.

These Baugh mills are varied somewhat in details of construction, for special purposes, from the one represented in the figure. Where it is necessary to crush and pulverize large quantities of material, it is found much more economical to crush in one machine, and after separating the fine material by means of sieves, to pass the remainder through another mill called a Finisher, which does not have any top breaker. The most important application of these mills has been to the disintegration of materials which are characterized more by their tenacity than by their hardness, such as bones, guanos, and dye woods; and during the Exhibition even leather has been successfully pulverized.



SECTIONAL VIEW OF THE IMPROVED CRUSHER SECTIONAL MILL.

For this class of work they are well adapted, combining sufficient strength of parts with considerable capacity in proportion to the power used. They are also claimed to be able to pulverize economically all kinds of hard mineral, quartz, etc. The abrasive action of these materials on the chilled iron linings is, however, so very great, necessitating frequent stoppages and loss of time, as well as the expense of renewal of the lining plates, that, although less power may be necessary per ton pulverized, than with machines working on different principles, it does not seem likely that they will be much used in gold or silver reduction works.

Several of these mills are kept at work in Machinery Hall, at Columns A. 61 and 62, Nevada Stamp Battery. A small annex has been erected on the south side of Machinery Hall, in which enough machinery has been put up to illustrate the Washoe process of amalgamating gold and silver ores. A battery, consisting of fine stamps, is used to pulverize the ore, which latter is from mines on the Comstock Lode.

Each stamps weighs 775 lb. and has a clear fall of 8 inches. They are raised by double cams, at the rate of 90 blows per minute. The crushing capacity is claimed to be twenty tons each 24 hours, a rather high figure which has been verified in practice, the mill only being run a short time each day. The shoes and dies are made of cast steel, and weigh 120 lb. each. The mortar is in one piece and weighs 4,400 lb. The stamps are driven by a small Baxter Engine, whose power is hardly sufficient for the work which it has to do.

A Tulloch automatic air-feeder is used to supply the ore to the stamps. These feeders, which have been successfully in use in many of the quartz mills in the West, are very simple in construction, and work admirably. A hopper, holding about 1,500 lb. of ore, slowly discharges its contents into a wide tray, which is slightly inclined forward, toward the feeding hole in the battery. This tray is suspended on links so as to allow it to have an oscillatory motion backward and forward, with relation to the battery. A system of levers is connected to the tray at one extremity, while the other is struck by an adjustable collar on one of the stamp stems whenever the battery needs feeding. That these automatic ore-feeders have been an important improvement is shown in the working of the new Consolidated Virginia Mill, which has sixty stamps, the services of six men having been dispensed with, and, by the regularity of its feeding, it is thought to have increased the yield of crushed ore twelve tons per day.

ABSTRACTS OF LECTURES ON MINING.—No. XVI.

By Prof. W. W. Smyth, M.A., F.R.S., Royal School of Mines, London.

(From the London "Mining Journal.")

WE now come to the consideration of mining proper, and commence with what is most important, and what, generally speaking, requires the largest outlay—the breaking of ground—in other words, the perforation of the rock. When we consider the great varieties of the ground, the different forms in which it may be opened, and the variation among the implements employed in different countries, we see that breaking the ground is not so simple a matter as some persons imagine. A man will not make an efficient manager unless he has mastered this primary subject, and nothing but actual experience will enable him to do so. Inasmuch as the men working a great part of the pit are paid by the amount of progress they make under certain conditions, it is evident that unless the manager knows, by actual personal experience, what the men ought to do, and how far they ought to penetrate in a certain class of rock in a given time, he will be liable to be imposed upon. This is especially the case in metalliferous mines, owing to great variations in the rocks. In some coal mines the conditions are much simpler. Nevertheless, the time necessary for acquiring this experience may be materially shortened by visiting different districts, and observing what is done under certain circumstances; or, what is, perhaps, not so good, by reading, and inspecting collections of the tools and implements employed. With regard to the nature of the rock, it is well to remember that what we consider the hardness of the ground from a miner's point of view is not purely the hardness of the rock in a mineralogical sense. A rock may be strictly harder than another, judged by a mineralogical scale of hardness, and yet be much more easily worked on account of its brittleness. Among the worst kinds of ground we have to deal with are certain varieties of quartz, hornstone mixed with pyrites, and some rocks in which hornblende is present, and imparts a characteristic toughness. On the other hand, some varieties of vein quartz can be worked with great facility.

We may, for convenience sake, divide the different kinds of ground into five classes, a division more or less recognized in most mining countries.—1. Loose ground, or "running ground," in the German *locker*, or *rollig*. This is soft watery ground, and has derived its name from its tendency to run into the excavations, etc. Examples of it may be found in many cases as superjacent materials over the coal measures, as in the North of France and Belgium, and, again, covering the Mansfield copper-slate. In the Durham coal districts, after passing through the magnesian limestone, the miners come on a bed of sand full of water, called the lower red sand, which, in this position, is one of the most difficult subjects a miner has to deal with. The main difficulty is not so much the removal of the material as the keeping it back, and preventing it running in on the apparatus and men; and in some cases this difficulty has caused the total collapse of the workings. Similarly in driving horizontally, the coming suddenly on such a bed, when not prepared for it, may lead to serious accidents. Such ground occurs even in the Cornish granite districts, where the miners call it plumb ground, and it may be so soft that planks have to be laid in the levels to walk on, in order to prevent sinking into it; and it shows a tendency to rise up into the levels. 2. The second class of ground is what may be called soft or fair ground, called by the Germans *mild*. This comprises certain kinds of tough clay, which can be readily cut; certain granites, growans, and porphyritic rocks; and others which would belong more to class 1 if they were not comparatively dry. 3. Jointy or scaly ground—*kurz, kleiftig*—comprising a great variety of quartz material and vein stuff, clay-slate granite, which is more or less intersected by veins, sandstone of the coal measures, which may be readily separated by joints, etc. 4. Shutting ground—*fest*—requiring explosives to break it. This division comprises the great majority of rocks in which mines are worked—hard sandstones or grits of the coal measures, for example. Where, by the intervention of a flaw, it is necessary to cut through a mass of this hard rock to recover the seam, the expense and difficulty are great, and this would be still more the case if, as some people have suggested, the use of gunpowder for blasting should be forbidden, because so many accidents have been traced to it. This measure would, certainly, be very hard on those who have to work such mines. 5. This last division comprises the hardest varieties of rock, which the Germans would designate by *fest*, with a special adjective affixed; tight or close ground, requiring special means of working it. Such rocks occur here and there, under certain circumstances. The great class of metamorphic rocks, as developed so largely in Sweden and Norway, Finland, etc., and, again, to the North of the Harz, and in Transylvania. Some of the very hard capels of Cornwall, and of the elvan dykes, would come in this class, as also some of the very dense greenstones and dioretic rocks, and in the North of England rocks nearly adjoining the great whin sill.

If we consider next the varieties of implements used for working these different rocks, we shall find that those used with the first class are devised so as to remove the material as quickly as possible, and to provide for the introduction of arrangements to insure the safety of the men. [The lecturer had on the table a large number of various kinds of mining tools, from different districts, illustrating his remarks.] A great variety of shovels are the main instruments employed, and on examining some of them we shall notice at once the difference of length between the short-handled shovel of the North of England and the long-handled shovel of the western districts. The blade is set on at a sufficient angle to the hilt, the great point about the long-handled tool being that it requires much less stooping, and that, when necessary, the knee can be used as a fulcrum. It is exceedingly difficult to say with which form a man is capable of doing most work in a given time. These English tools are for overhand work, but on the Continent we shall see that their tools are very often for underhand work. Instead of throwing out the material it is usual for them to scrape it forward into a kind of tray or box, which is then easily lifted and emptied into the wagon. In Spain they are very fond of scraping the materials into baskets, which they then empty into the wagons, and there is no doubt that by this method they cannot get through the same amount of work as could be done if the raw material were thrown over at once into the wagon. Another class of shovel must be mentioned, which is employed in gold and tin stream works, that has for its object the sifting of the material, to a certain extent, at the time of digging; some forms of it are like potato forks, with very numerous prongs. Generally speaking, it is the small material which falls through: that has to be afterwards dressed, the pebbles left in the spade being just glanced over, to see if there is anything worth being sent to the stamps.

For the second class of rocks the tool most commonly employed is the pick. [The lecturer recommended a book by Mr. W. MORGANS on Mining Tools, as containing much accurate information on the subject, combined with good illustrations.] The pick is essentially the collier's tool; the metalliferous miner uses picks of a rather different kind. In the West of England a single pointed pick is almost universally employed. The Cornish pick has a hilt somewhat curved forward toward the point of the pick, made of the best wood, as ash; the head is of iron of the best quality, 15 inches long being an average size. The ends are steeled, one as a point for picking, the other as a hammer; the picks, as a rule, being made and repaired by the smiths on the mine. A great point to be secured is that the eye should not be merely of sufficient depth to enable the hilt to hold firmly, but also that it should not come too fine at the extremity, so as to be easily thrown out of the true position in which it is set. Another great use of the pick, besides that of penetrating by a blow, is as a lever, the leverage being obtained by means of the long handle, and the part about the eye has to be made sufficiently strong to bear this leverage. The hammer end is not usually left square, but the angles are chamfered off. A lighter pick, of very singular construction, is employed where the ground is more easily broken, and you wish to penetrate to great depths. Single pointed picks are employed on the Continent, and you will see in this one from Saxony that the hammer end is not so large, scarcely distinct at all. In some of our Pembroke anthracite districts single pointed picks were in use some years ago (the lecturer could not say whether they were still employed); in all our other collieries the use of the double-pointed pick is universal. For some kinds of work, as in the getting of china-clay, a single pointed pick with the head considerably widened is used, and in some gold districts it is used as a clearing instrument. The double pointed pick is used by the metal miners of Derbyshire and the North of England in some cases, especially when cutting through a hard rock, and when they have plenty of room. The eye must be 2¼ inches or more in length, and its hold on the hilt strengthened by cheeks; the sides of the hilt are frequently feathered at top, so as to give greater strength. When one point is blunted, or used up, the other is ready to be employed. The weight and form of the head vary according to the kind of work on which it is to be employed. Some have a straight head, but as a general rule it is more or less curved, the amount of curvature being determined by its lying in the circumference of a circle of which the radius is the distance from the head of the pick to the end of the arm working it. The longer the handle the more nearly then will the head approach to a straight line. One of the first operations in getting the coal is the holing, or kirving—that is, cutting a groove underneath the mass of coal, either in the coal itself or in the rock beneath it. Then, if the coal is traversed by vertical joints, it is readily broken down; but with certain classes of coal, or if working in a very narrow place, it will be necessary to cut a vertical groove on one or both sides of the mass, when it can readily be brought down by wedging. For the horizontal cutting a light pick, more or less curved, is employed, as it requires considerable experience to wield it properly in the position in which the miner has to lie; and, after all, there is a great variation in the skill of the men. In most coals of our central districts we can hole in to a depth of 3 or 4 feet, or in some cases even to 6 feet. In the latter case it is necessary for the miner to get right underneath the mass, and many accidents occur from the neglect of proper precautions as to propping and supporting the portion already holed. Some of these light picks, from North Staffordshire and Wales, weigh no more than 2 lb. in the head; if the coal be harder, and requires a stronger blow, a heavier pick is used; and, as a rule, a heavier pick is employed for the vertical cutting than for the horizontal holing. The length of the hilt is from 25 to 30 inches, rarely from 30 to 35 inches, as in some of the Welsh mines. The form termed an anchor pick is preferred in the Durham district It is always an essential thing to look to regarding these picks that, besides having sufficient length of eye to give them a firm hold, and to prevent their being turned out of position, the steeling of the points should be properly done. These points are never rounded, but have a somewhat pyramidal shape, or in some cases a very narrow shaped chisel edge. The picks receive various names, as pikes (Staffordshire), mandrils, or slitters. The most remarkable picks, perhaps, are those used in getting the great masses of oolite from the Box quarries, the handles being 6 feet long, and the head set on at a slight angle. It is necessary to rest the pick in this last case for a moment before commencing the next blow. Nevertheless, rapid progress is made, about 25 blows per minute being given. In harder ground heavier and stronger picks must be used, as, for instance, in roading in the collieries, where you have to dig up the hard, strong clay. The lecturer did not think that we had much to learn from the continental miners with respect to the implements to be employed; our men have been pretty successful in devising tools best suited to their own districts. Nothing, for instance, can exceed the Cornish pick in its own class of ground.

The hammer and wedge were, in former days, before the introduction of gunpowder, the chief means of breaking ground where it was of considerable hardness, the pick-head being sometimes employed in conjunction with the wedge. Wedges on the Saxon plan have a small hole in the middle, so that they look somewhat like small hammers; a handle can be inserted into this hole for the purpose of holding the chisel while driving it in. This method is very useful, especially when wedging up high. A number of these wedges are slung together on an iron strap and over the man's shoulder, thus leaving his hands free for climbing, etc. In Cornwall the wedge is somewhat of the same character, without the contrivance for using the handle; it is driven either by a special hammer or by the head of the pick.

Perhaps one of the most surprising things in the world is to see in the stone quarries of the ancient Egyptians at Syene, etc., the wonderful extension of this method of wedging; by its means they were enabled to get their obelisks of over 90 feet long in a single stone, a feat which, it appears, we cannot now accomplish. In some cases wooden wedges are employed, put in dry and then moistened; or, again, we may use what is called plug and feathers, where an iron wedge is driven in between two cheeks of iron previously inserted, the sides of the hole being thus less broken. The hammers used are either single-handed (3 to 5 lb. weight), or double-handed, and of various forms. Every collector of mineralogical or geological specimens knows how important it is to have the edges of his hammer-face sharp; this is especially looked to in some of the Welsh quarries, and the face of the hammer between the edges is even indented. The cobbing hammer for dressing copper ores, and the buck and iron-plate, bound on to pieces of wood, for crushing ores, are both special forms of hammer.

THEORY OF LUMINOUS FLAMES.—Dr. KARL HEUMANN considers the circumstances that a gas-flame does not actually touch the edge of the burner, nor a candle-flame the summit of the wick; and that a flame never comes in close contact with a cold body is due to the fact that heat is conducted away by the solid body. The flame-gases are cooled for a certain distance below their ignition-point, and the flame is consequently extinguished within this region. The distance between a gas-flame and the burner is considerably increased if the inflammable gas or vapor streams out under a high pressure, or is mixed with a large amount of some non-inflammable gas.

This phenomenon is due not merely to the cooling action of the gaseous stream and of the external air, but to the fact that the speed of the issuing gas stream close to the burner is greater than the speed of the propagation of ignition. When other influences are not essential, the flame begins in that section of the issuing gas-current where its speed equals the speed of the propagation of ignition. Hence this speed of propagation for different gases and vapors may be experimentally ascertained. In case of solids and liquids of a combustible nature the same speed may also be readily found by experiment, and the results may be regarded as relative numerical expressions of the dangerous character of the combustibles in question.—*Liebig's Annalen der Chemie.*

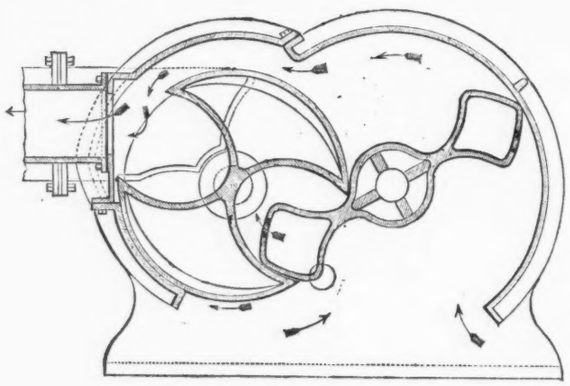
BLOWING AND VENTILATING MACHINES AT THE PHILADELPHIA EXHIBITION.

Special Correspondence of the Engineering and Mining Journal.

(*Continued from page 282.*)

THE DISSTON BLOWER.

THE first of the machines made after this patent is now exhibited in the Pump ANNEX, near the Roots' exhibit. The internal construction of this blower is shown by the cut below. It will be seen that there is one revolving drum which acts as an abutment to prevent the escape of the air which is being forced, while working in this, and against the cylindrical casing, there are two vanes carried by a small revolving cylinder. The air to be expelled is partially brought in by the abutment drum, and partially by the revolving vanes. Besides the loss which occurs from leakage, it will be seen that at each revolution of the drum a portion of the compressed air is lost, which is not driven out by the square headed vanes. The escape of this air, and the direct delivery of the compressed air into the discharge pipes, make the machine exhibited work with considerable concussion. A different arrangement with respect to the positions of the revolving vanes and drums is contemplated, which it is expected will remedy this difficulty. The air passes into the delivery pipe through these openings, one on each side, and the third in the front of the case.



In order to insure the regular working of blowers constructed on this system, considerable care will have to be exercised in the fitting and construction of the gears which are used to connect the abutment drum with the small cylinder carrying the vanes. Unless this is done, the vanes are liable to strike against the sharp edges of the holes in the abutment drum. If well made in this respect, the machine should run without producing much wear on the cogs, as the only power which has to be transmitted through them is that necessary to overcome the friction of the abutment drum, which itself does no work in expelling the air.

THE ELLIS BLOWER.

In the invention of rotary pressure blowers, the English do not seem to have been very prolific, and the single machine of this class which has been sent here, will probably not prove a very dangerous rival to our American makers. The Ellis blower, which is exhibited in the English Department in Machinery Hall, consists of a cylindrical casing inclosing an eccentricly placed drum like the blower just described. This drum is made longer than the casing, and projects from it at either side. The line nearest tangency between the drum and casing is on a horizontal plane passing through the axis of the casing. The air is admitted on the top of the casing above this line, and the delivery opening is below it. That portion of the drum inclosed in the casing has three equi-distant rectangular holes cut in it, the area of each of which is one-sixth of the area of the cylindrical surface of the drum. These spaces are filled with wrought iron buckets, which are hinged on bolts running across the drums at one side of these openings in them. These buckets extend across the openings, and where they come in contact with the other edges of the openings, they are bent inward so as to nearly form a right angle with the other portion.

Connecting rods are hinged underneath the buckets which are hung at the other ends on a shaft running through the drum from end to end, which passes through the axis of the cylindrical casing. By this arrangement the buckets are kept constantly nearly in contact with the casing along the line where they are hinged to the connecting rod. As the drum moves forward, these buckets successfully confine portions of the air admitted through the opening in the top of the casing, and force it out in precisely the same manner as in the Dougherty blower. It will be seen that the portion of the buckets which is bent inward, serves to prevent the air from escaping into the interior of the drum while it undergoes compression, or is being forced out into the delivery mains. Counterbalance even weights are keyed to the rods on which these buckets turn. The many working parts and open joints which this machine has, with the consequent opportunities for the compressed air to escape, must make this machine, when working under the most favorable circumstances, very uneconomical in the use of power, and it is difficult to see how the very roughly constructed machine which is exhibited here can do any effective service at all.

ACTIVITY IN OHIO COAL MINES.—Nearly all the coal mines in the vicinity of Youngstown, Ohio, are being worked to their utmost capacity in order to load a number of vessels at Cleveland and Ashtabula, previous to the close of navigation, which is expected to set in early this year.

WATER-GAS AS A FUEL.

TO THE EDITOR: SIR—Although scientists have heretofore admitted that there were undoubtedly great possibilities involved in the gaseous products of water, the failure to produce them on a practical scale must account for the fact that little has been said or known of their high comparative value.

The recent successful production of water-gas in large volumes, and at very economical cost, in connection with illuminating operations in this country, having thoroughly demonstrated the practicability of the process, very interesting questions present themselves as to its properties and value as a calorific agent. The enormous waste attendant upon the use of coal and other crude forms of fuel, besides the excessive labor involved in the handling of these heavy materials, to say nothing of their high cost in many localities, give the investigation peculiar importance. I propose to lay before you certain interesting facts in connection with the subject, and if my imperfect presentation thereof serves to stimulate an examination by abler hands, I shall be much gratified.

We are met at the outset by the objection that "it is impossible to get more heat from a given weight of coal than it contains." A truism by which it is meant to assert, that if the heat units of the gaseous product are accurately ascertained and compared with those of the fuel expended to produce them, they will be found to be somewhat less, proving a positive loss in the process of change. This is undeniable, if these tests are made upon a laboratory scale, the coal and its gaseous product being burned under water, and so compared; but it should be remembered that no result in practice, even remotely, approximates to this, not more than one-tenth of the actual heat units of coal being utilized by the ordinary methods.

The real question is, whether by transmuting the heat-giving elements, or a large proportion of them, from a solid to a gaseous form we do not gain a condition wherein they can be employed with so much greater economy as to more than compensate the loss involved in their gasification. The Siemens gas furnace is generally admitted to illustrate this, and as that method is supposed to represent the most advanced system, it is proposed to institute a comparison between it and the Lowe Water-gas Process.

The gases delivered by the Siemens Producer are the result of a decomposition of atmospheric air, by contact with incandescent carbon. A number of analyses give the following as an average composition per cent. by volume, viz.:

Of hydrogen	7
" carbonic oxide	17
" " acid	7
" nitrogen	69
	100 cubic feet.

It will be seen that only 24 per cent. of these gases are combustible, and that carbonic acid is present in equal proportions with the hydrogen. This small amount of gas, available for heating purposes, is weighted down with three times its own bulk of non-combustible nitrogen and carbonic acid.

The action of these two last named constituents in calorics has not been generally understood or properly estimated. The nitrogen is not merely diluent, but a divisor, and therefore robs the combustible gases of heat to a very serious degree. An inevitable factor in combustion, it is peculiarly undesirable as an initial element.

Carbonic acid is yet worse, being not only "non," but really *anti*-combustible, and its antagonism to flame largely neutralizes an equal amount of the combustible gas with which it is associated. The precise figures to cover these points are not determined, and therefore will be presented in a later communication. Even omitting these important items, we shall find quite enough in the way of surprise for this preliminary paper.

The water gas produced by the Lowe process is of the following composition, according to Prof. WURTZ'S analysis:

Hydrogen	66
Carbonic oxide	34
	100 cubic feet.

Nitrogen and carbonic acid being substantially eliminated. If any variation from these figures occurs it is one of proportion and not of constituents. For the purposes of this calculation it is hardly necessary to discriminate in the calorific values of hydrogen and carbonic oxide, these differences being unimportant for the moment. The first proposition calculated to conflict with preconceived ideas, is that a given weight of fuel will, in practice, yield at least as large a volume of gas from water as from air. The Siemens process claims, *by estimate*, 50 thousand cubic feet from a ton of clean coal (see PERCY'S "Fuel"), while the Lowe process has obtained this amount by actual measurment. We have, therefore, only to investigate the calorific values of the two products to determine the question of relative economy. The volume of gas from one ton of clean coal would be in the following proportions:

Process.	H.	CO.	CO^2	N.	
Siemens	3,500	8,500	3,500	34,500	50,000 cubic feet.
Lowe	33,000	17,000	0	0	50,000 " "

In combustion in atmospheric air the comparison would be for the combustible products of one ton of coal, as follows:

Process.	N.		CO^2		O.
	Initial.	In Burning.	Initial.	Total.	Required in Burning.
Siemens	34,500	24,000	3,500	62,000	6,000
Lowe	none.	100,000	none	100,000	25,000

In other words, the Lowe gas will burn at the same cost 4 1-6 times as much oxygen as the Siemens, with an increase in nitrogen of only 61 per cent, or, to state it in another form, 4 1-6 times the amount of fuel is required by the latter to obtain an equivalent calorific result, without bringing into the computation the divisory function of the initial nitrogen or the depreciating influence of the initial carbonic acid, which are in no way impaired by Mr. SIEMENS' admirable regenerative system.

The following table will illustrate this last statement:

Process.	Coal.	Initial.		O.
		Combustible gases.	Non-combustible.	In Burning.
Siemens	9,333 lb.	50,000 feet.	158,333 feet.	25,000 feet.
Lowe	2,240 lb.	50,000 "	none.	25,000 "

In addition to these important differences in calorific value, there is also a very considerable gain in the matter of intensities, the water-gas showing an increased temperature of about 240° Fahr. The economic relation of this quality to time and labor in metallurgical operations is manifest, and the question also presents itself whether, with a combustible gas which in burning should certainly require less pressure of air blast, the cutting heats which involve so much loss, might be avoided. The possibilities which a discussion of the subject naturally suggests, not alone in industrial enterprises, but in those smaller economies of domestic uses which aggregate such great proportions, we must reserve for future presentation, remaining content with a mere opening of the matter on this occasion. Respectfully, G. S. DWIGHT.

THE LOWE GAS PROCESS AT MANAYUNK.

WE take the following from the *Polytechnic Review* of October 28 :

"The history of the efforts to economize the gases produced by the decomposition of water in the manufacture of illuminating gas, and which for the past sixty years or more have been persistently made, have, until quite lately, been so uniformly unsuccessful, promising so much but fulfilling so little, that the great majority of gas experts had arrived at the conclusion that from some fallacious premise in their proposition, the logic of the advocates of water-gas was radically false, and their hopes impossible of realization. Within the past few years, however, a marked change has been brought about in the opinions of many who were the most strenuous opponents of the "*ignis fatuus*" of water-gas, as the general incredulity had caused it to be proverbially designated. And now, the tide has turned the other way. The problem has been solved ; and solved, too, in a fashion so practical and satisfactory, that opposition is virtually disarmed, and prejudice almost silenced.

"The foregoing remarks have special reference to the Lowe Water Gas Process, in view of its recent record at the Manayunk station of the Philadelphia Gas Trust, where it has lately been introduced.

"The following points, from the history of the Lowe process, will be found of interest :

"The 'Lowe Water-Gas Process' was first introduced in the working scale at the town of Phœnixville, Pennsylvania, some three years ago. These works have been in operation, without interruption for repairs or other causes, from the date of going into operation to the present time, supplying in Summer about 5,000, and in Winter 10,000 cubic feet of gas per day. The experience at Phœnixville demonstrated, to the complete satisfaction of those interested, that the product of the Lowe process was no more liable to stratification and condensation than the product of ordinary coal-gas works—one of the gravest objections that water-gas systems have had to meet. The system was next introduced at Conshohocken, Pennsylvania, some two years ago, where up to the present time, it has been in satisfactory operation, supplying in Summer some 6,000 cubic feet, and in Winter about 12,000 cubic feet of gas per day. The efficiency of the Conshohocken plant will be best appreciated when it is stated that, from the date of starting the works, one man has made all the gas, collected all the bills, attended to all the service pipes and meters, and has not been employed at the works more than three hours of each day.

"Shortly after the completion of the Conshohocken plant, works were erected on the Lowe system at Columbia, Pennsylvania, and up to this time have been producing from 22,000 to 25,000 cubic feet daily.

"The Lowe Gas Works at Utica, N. Y., a city of some 30,000 inhabitants, built in the year 1874, were the largest that had up to that time been erected. Their capacity was over 200,000 cubic feet daily. The actual production for a number of months, until the unfortunate destruction of the works by fire, was about 120,000 cubic feet daily, representing a total production from April, 1874, to January, 1875, of 21,000,000 cubic feet. The works in question were erected hurriedly, to meet the terms of a contract, and at the season of the year when the erection of a permanent structure was impossible. In consequence thereof, they were built largely of wood. The inopportune destruction of the Utica plant was the subject of much regret at the time of its occurrence, for the performance of the works had been so remarkably successful as to have attracted the attention of professional gas-engineers throughout the country. The technical papers at the time teemed with glowing accounts of the successful solution of the 'water-gas problem,' and the leading gas chemist of the country, after a thorough examination of the process and product, gave the system his unqualified approval in a report of a most exhaustive character.* The Utica works, nevertheless, were sufficiently long in operation to demonstrate the perfect adaptability of the Lowe system for the production of illuminating gas of high quality upon the largest scale, and to secure for it the distinction of being a thoroughly practical solution of the 'water-gas problem,' which a generation of inventors had been vainly striving to attain. It is affirmed, at the time of this writing, that the works will be promptly rebuilt.

"Within the present year, the Lowe system has been introduced at Dobson's Mills (Falls of Schuylkill), Stroudsburg, Pennsylvania ; Clyde, and Fortplain, New York, and at Manayunk, a suburb of Philadelphia.

"At Kingston, Canada, works are at present in course of erection, and the company under whose efficient management the Lowe process has reached its present successful attitude, has effected contracts for the building of works at the cities of Lancaster and Harrisburg in Pennsylvania, Trenton in New Jersey, and Baltimore in Maryland.

"The Lowe Gas Works at Manayunk, with which we are here specially concerned, were built as test works. They were completed during the Summer of the present year, and went into operation on the 4th of August.

"The plant consists, essentially, of three generators (of which at present but two are used), and six superheaters, three of which are used for superheating steam and three for fixing the gas. The other portions of the plant, condensers, purifiers, etc., will require no special mention. The generators are 10 feet, 6 inches in height, and have an internal diameter of 40 inches. The superheaters are 15 feet in height, and have an internal diameter of 34 inches. Both generators and superheaters are very solidly constructed of fire-brick, and have double wrought iron walls, with an intervening air space. Generators, superheaters, condensers, scrubbers, and station meter are all contained within a building 27×57 feet. The capacity of the new works is estimated to be 350,000 cubic feet ; but up to the present time, they have been producing from two of the generators, worked only to one-half of their capacity for production, about 150,000 cubic feet daily, and having an average illuminating power of 19 to 21 candles. (Photometric tests of the gas made in several successive heats, during a recent visit of the writer, indicated an average illuminating power of 20 candles.)

"The experienced observer, in examining the works in question, will be struck at once with two facts, namely, the great compactness and simplicity of the plant, and the surprising rapidity with which gas of excellent illuminating power is produced. These points will be best illustrated by the following comparison :

"The old works (the usual coal-gas plant) occupied with all their necessary appurtenances, about an acre and-a-half of ground. The retort house (109 feet long by 33½ feet wide) was furnished with ten benches of threes, and when worked continuously to their full capacity, could produce about 5,000 cubic feet of gas per hour, a quantity not sufficient to supply the local requirement, and the deficiency was supplied by running into the holder an additional supply from the Market Street works.

"The new works occupy scarcely one-tenth of the space of the old (the essential portions of the plant, as before remarked, being included in a building 27×57 feet.) They are not run up beyond one-half of their capacity, and are supplying on an average 150,000 cubic feet of 20-candle gas daily, quite enough to meet local requirements, and employ the services of but seven men, three on the night shift, and four during the day. The results obtained, although highly satisfactory, and extremely gratifying to progressive gas engineers, are, however, by no means as complete as possible. The greatest economy in cost of production will naturally be found when the works are running up to full capacity. At Manayunk the two generators and three superheaters are so alternated that while one set is employed in generating and fixing gas, the other pair is being blown up preparatory to a charge. The duration of an operation is about thirty minutes. The average run of each set is from 6,000 to 6,500 cubic feet in the period named, but this volume has frequently been greatly exceeded and single runs on one set of apparatus have given as much as 13,500 cubic feet in thirty-five minutes. The cost of the 20-candle gas delivered into the holder, inclusive of labor, and interest on the investment, is admitted by the managers to be about 35 to 40 per cent. less than that of coal gas of 16 candle power supplied to the city. This estimate at the present high price of petroleum will certainly be reduced when oil is cheaper. The quantity of oil supplied to the generators is gauged to flow at such a rate that about three gallons of oil shall be supplied, to the one thousand cubic feet of gas made. This quantity has been found by experience to be about the best proportion, when the heats are right, for making gas of 20-candle power. Up to the present time the Manayunk works have been in operation without the slightest interruption from the date of starting, and have supplied about 10,000,000 cubic feet of gas. W.

* See the ENGINEERING AND MINING JOURNAL, vol. xx., 502 et seq. ; also this Journal, vol. i, 2 et seq.

OIL PIPE LINES.

TOTAL mileage of iron pipe used for conveying oil in the Oil Regions of Pennsylvania :

LINES.	Size of Pipe. 2-in.	Size of Pipe. 3-in.	Total Miles.	LINES.	Size of Pipe. 2-in.	Size of Pipe. 3-in.	Total Miles.
	Miles.	Miles.			Miles.	Miles.	
Atlantic Pipe Co.	80	10	90	Octau Pipe Co.	20	.....	20
Amer. Transfer Co.	50	22	72	Olean Pipe Co.	33	.....	33
Ant. & Oil City P. Cos.	.....	.....	136	Penn. Transportation Co.	380	.....	380
Brady's Bend Iron Co.	1½	.....	1½	Prentice F. & Co.	¾	.....	¾
Church Run Pipe Co.	6	.....	6	Pacific Pipe Co.	2	....	2
Charley Run Pipe Co.	1¼	.....	1¼	Private Pipe (Foxburg)	2	....	2
Cherry Tree Run P. Co.	25	.....	25	Richard Jennings P. Co.	3	.....	3
*Columbia Conduit Co.	71	51	128	Relief Pipe Co.	100	.....	100
Connewango Pipe Co.	5	.....	5	†Rochester & Oleopolis Co	30	3	40
Franklin Pipe Co.	9	1	10	Sage Run Pipe Co.	5	.....	5
Grant Pipe Co.	120	.....	120	Shaffer Run Pipe Co.	1⅛	....	1⅛
Hunter & Cummings P.Co	5	½	5½	Smith's F'y & I. Run Co.	5	.....	5
Karns Pipe Co.	82	.....	82	Titusville Pipe Co.	40	.....	40
Keystone Pipe Co.	30	.....	30	Tidioute Oil Pipe Co.	11	2	13
Milton & Sandy P. Co.	52	1	53	Tarr & Payne Pipe Co	10	.....	10
McKain County Pipe Co.	16¾	.....	16¾	Union Pipe Co.	300	.....	300
New York Pipe Co.	40	.....	40	‡United Pipe Co.	276	24	300
N. Y. & Allegheny Oil Co.	5	.....	5				

Total Mileage..... 2,081¾ miles.

* 6 miles of 4-inch included in total. † 7 miles of 6-inch included in total.

‡ Operating Milton & Sandy and Franklin Lines.

Atlantic Pipe Company collects oil in Clarion County, and delivers it to the Valley Railroad at Foxburg, through 3-inch pipe, and through 2-inch pipe at Sligo, to the Sligo Branch of the Low Grade Railroad.

American Transfer Company collects oil in Clarion County, and delivers it, through 2 and 3-inch pipes, at Emlenton, to the A. V. RR., and at Oil City.

Antwerp Pipe Company collects oil in Clarion County, and delivers it, through 2 and 3-inch pipes, at Fullerton, to the A. V. RR., and at Oil City.

Columbia Conduit Company collects oil in Butler County, and delivers it, through 2, 3, and 4-inch pipes, at Montrose, to Pittsburg refineries ; also ships in barges down the Ohio River.

Grant Pipe Company collects oil in Armstrong and Butler Counties, and delivers it, through 2-inch pipes, at Parkers, to the A. V. RR. and barges on the Allegheny River.

Karns Pipe Company collects oil in Butler County, and delivers it to the A. V. RR. and barges on the river, at Parker's ; also at Hilliard's Station, to the S. & A. RR.

Relief Pipe Company collects oil in Butler County, and delivers it at Sarah Furnace to the A. V. RR.

United Pipe Company collects oil from all parts of Butler County Oil Field, and delivers it, through a 3-inch pipe, to the Franklin Branch of the L. S. & M. S. RR., at Raymilton; through 2-inch pipes to the Shenango and Allegheny Railroad, a branch of the A. & G. W. R. W., at Harrisville and New Hope, to the A. V. RR. at Brady's Bend and Monterey, in Clarion County; collects from Clarion County Oil Field, and delivers it at Oil City ; collects the heavy oil around Franklin, and delivers it to railroads and refiners at that place ; also collects the oil from Bullion Run, and delivers it at Raymilton.

Union Pipe Company collects oil from Clarion and Armstrong Counties, and delivers it at Foxburg, and at the mouth of the Clarion, to the A. V. RR. and river barges ; also collects from all parts of the Butler Oil Field and Bear Creek, in Armstrong, and delivers at Parker's and vicinity, to the A. V. RR. and river barges.

Pennsylvania Transportation Company collects oil in Warren, Forrest, and Venango Counties, and delivers it to the P. T. & B. RR., at Tidioute, Trunkeyville, Shaffer, Miller, and Titusville ; also collects oil in Butler County Oil Fields, and delivers it to the A. V. RR. and river barges at Brady's Bend, in Clarion County.

Hunter & Cummings' Line collects oil on the cross belt in Butler and Arm-

strong Counties, and distributes it through 2-inch pipes at Brady's Bend, to the A. V. RR.

The balance of the pipe lines collect and deliver the same in the various parts of the upper oil fields. Some of the principal ones are as follows :

Taft & Payne Pipe Line collects heavy oil in and around Franklin, and delivers to the railroads and refineries at that point.

Cherry Tree Run Line collects on Cherry Tree Run, in Venango County, and delivers to the P. T. & B. RR. at Rynd Farm.

Titusville Pipe Company collects at Pleasantville, Colorado, Pithole, and other points, and delivers it to railroads and refineries at Titusville.

N. Y. Pipe Company collects at Hickory, Fagindas, and vicinity, and delivers at Titusville, also at Garland, to the P. & E. RR.

Octau Pipe Company collects from the Octau District, near Titusville, and delivers to railroads and refineries at Titusville.

Warren Pipe Company collects at Warren, and delivers to the P. & E. RR. at that point.

Conewango Pipe Company, collects at Warren, and delivers to the D. A. V. & P. RR. at Warren.

McKean County Pipe Company collects oil in the Bradford District, and delivers it to the B. B. & P. RR. at Bradford.

Olean Pipe Company collects oil in the Bradford District, and delivers it to the B. N. Y. & Phila. RR., at Olean, N. Y.—*Stowell's Petroleum Reporter.*

A STUDY OF THE IGNEOUS ROCKS.*

By Prof. Persifor Frazer, Jr.

I DESIRE to say that, owing to the number of papers which have been more or less crowded at this session of the Institute, and the fact that, as one of the Local Committee, I have the distinguished honor to fee lsomewhat like one of the hosts, I should not tax the patience of members at this late hour, but would have my table read by title were it in any way possible to do this. But the task I have set myself this evening is to present to the eyes of the members of the Institute certain objects which have occupied more or less of my time during the last eighteen months or two years. The objects I allude to are some of the igneous rocks of this country, which, until quite recently, have been less understood than any others.

It will be well known to some of the members that some of the cooled lavas of a previous age of our planet, when not directly coarsely crystalline and granular, were considered, and spoken of, as "natural glasses," or perfectly uncrystalline, vitreous, or hyaline masses of matter.

Among the first results of the use of the microscope was the dispersion of this fallacy. Sir DAVID BREWSTER, Mr. H. C. SORBY, and WILLIAM NICOL (the discoverer of the celebrated calcite prism, which bears his name), had, with grea er or less success, examined sections of various rocks and minerals, both by transmitted and reflected light, and also in the form of powder. But, until the genius of VOGELSANG undertook the subject, these investigations had no permanent value, nor did they constitute an independent line of mineralogical and geological research. Since the close of his labors, by VOGELSANG's premature and much lamented death, the subject has been made one of renewed interest by his brother-in-law, FERDINAND ZIRKEL, ROSENBUSCH, TSCHERMAK, and many others abroad, and at home by the commencement of a systematic study of the traps of Connecticut by Messrs. E. D. DANA and G. HAWES, of New Haven, and by the splendid set of described sections of the traps of the West, which have been furnished by ZIRKEL to illustrate CLARENCE KING's report.

I had the honor of presenting a large number of thin sections of our traps, at the Washington meeting, for the inspection of the members, with the aid of a table microscope belonging to the Smithsonian Institute. Here I propose to project these sections upon the screen so that all can see them alike. Before I do this, however, I will introduce a few words to inform those who have never paid any attention to this subject, how these slides must be prepared. As thin a fragment as possible of the rock is chipped off with the hammer. One side of this is rubbed down on a cast iron plate with emery and water, as nearly as possible to a perfectly smooth and level plane. (This is not such an easy matter as it might seem.) This being done, the surface is washed carefully, so as to exclude every particle of dirt, when, to guard against the possibility of small cavities filled with powder, the tongue is called into requisition to discover them. When perfectly clean, the specimen is warmed to drive off all moisture, and then is attached to the holding glass, by pressing it against Canada balsam which has been boiled half a minute or more, and is still soft and adhering to the glass. If properly treated, the balsam will harden in five or ten minutes.

The holding glasses which I prefer are strips of mirror plate glass, ¼ inch thick, and ground on one side. This latter precaution, to which I was driven by the sacrifice of many fine specimens, appears to be a very needful one, and if attended to will save much vexation and disappointment. The thick glass is then taken in the fingers and the other side of the rock or mineral fragment is rubbed on the plate until the required thinness is reached, a point which is determined by the equal transparency of the section in all its parts. The portions of balsam outside of the outline of the section are then cut away with a penknife. A clean thin glass slide is warmed and provided with a small drop of balsam, the holding glass is then gently warmed and inclined over it, and, if necessary, the section is eased off by the aid of a penknife or other object. The thin slide is again warmed until the drop of hardened balsam distributes itself over the surface and flows freely with the section. If the latter is not already completely immersed in balsam it is either gently pressed beneath the surface or parts of the balsam are placed over it.

A thin cover glass is then laid on the glass, so thatit is in an *inclined position*, one end projecting into the air and over the section. By warming the slide gently, the cover will then descend evenly, allowing all the air to escape. A little practice is necessary to get the object in the middle of the glass-slide and well trimmed.

There is no means of determining the necessary thickness of a section, except for a particular case. In no instance should the section be so thick as to cause the cover-glass to break when the two ends are pressed over it against the glass-slide. On the other hand, minerals of characteristic color become sometimes colorless when sliced too finely. The thickness of those, which it is my intention to show to-night, varies from 1-150th to 1-500th of an inch.

[A number of dolerites from Adams and York Counties, Penn., were here thrown upon the screen, and resolved into their constituents labradorite, pyroxene, and magnetite. Biotite and apatite were recogn zed by their forms and their effect upon polarized light. A rare trap, from near the western edge of the mesozoic red sandstone in York County was shown to consist largely of pegmatolite, with much hornblende. The coarse and fine grained dolerites were compared. Other rocks, belonging to sub-silurian (Huronian (?)) age, such as the orthofelsite-porphyry of the South Mountain, near Mont Alto, and a quartzite, of which this mountain is largely composed, were then projected, and attention was called to the fact, that in the latter specimen some of the constituent particles of silica were angular, and some were rounded.

* A paper read before the American Institute of Mining Engineers, at the Philadelphia meeting, June, 1876.

INTERNATIONAL EXHIBITION OF 1876.

Special Report of the Engineering and Mining Journal.

ADMISSIONS FOR THE WEEK ENDING NOVEMBER 2, 1876.

Date.		Paying Visitors.	Press, Complimentary, and Exhibitors.	Total Visitors.
Previously reported.....	.....	6,435,791	1,583,927	7,974,718
October 24.....	144th Day..	88,520	12,237	100 757
" 25.....	145th " ..	106,986	12,303	119,289
" 26.....	146th " ..	122,300	13,361	135,661
" 27.....	147th " ..	95,563	12,517	108,080
" 28.....	148th " ..	78,730	12,242	90,792
" 30.....	149th " ..	80,039	12,540	92,579
Totals.....		7,007,929	1,614,127	8,621,876

THE LAKE SUPERIOR IRON AND ORE SHIPMENTS AND TRADE.

WE compile from the Marquette *Mining Journal* and the Ishpeming *Iron Home* the following, showing the output for the season of iron ore and pig iron from the mines and furnaces of the Lake Superior District up to the 25th of October :

The feeling throughout the iron districts is very encouraging, and it seems to be conceded that an era of better times is before them. Exp orations are being resumed, and partially abandoned mines are being started up again, and several new discoveries are reported. It will be observed that the shipments to date exceed those of 1875 by nearly 123,000 tons, and while prices are very low, yet it is thought that they are fairly remunerative.

Iron Ore.

FROM MARQUETTE.		FROM ESCANABA.	
Republic Mining Company.....	110,214	South Side Jackson Mining Co.	11,430
Cleveland "	104,194	Jackson "	58,096
Lake Superior "	88,014	New York "	40,198
Champion "	63,206	Cleveland "	11,040
Edwards "	15,411	Angeline "	22,064
Rolling Mill "	19,774	Barnum "	30,329
McComber "	7,636	Foster "	320
New York "	9,986	Saginaw "	53,629
Erie "	1,058	Palmer "	11,409
Grand Central "	455	McComber "	7,034
Winthrop "	817	Rolling Mill "	12,072
Shenango "	968	Shenango "	1,169
		Excelsior "	629
Total.....	421,723	Cambria "	4,767
FROM L'ANSE.		Richardson & Wood "	5 645
Spurr Mountain Mining Company	20,936	Winthrop "	13.564
Michigamme "	52,356	Salisbury "	17,508
Keystone "	6,696	Bessemer "	4,307
		Superior "	10,710
Total.....	79,988	Michigamme "	10,005
		Total.....	325 985

The following is a comparison of the aggregate shipments, with those for the same period in 1875 :

	1875.	1876.
From Marquette	424,444	421,733
From Escanaba.....	217,479	325,985
From L'Anse	63,196	79,988
Total.....	705,119	827,706

Showing an increased product for this year of 122,587 gross tons.

Pig Iron.

GRAND ISLAND FURNACES.		MARQUETTE FURNACES.	
Bay furnace.....	7,320	Morgan furnace	2,651
Munising furnace.....	1,554	Pioneer furnace	3,181
		Bancroft furnace.....	3,241
Total	8,874	Total	9,073

Prices of Ore, f. o. b. at Cleveland (standard quality) have generally ranged, during the season at from $7 to $7.50. The present rate will probably range between the extreme prices given.

We append the following interesting statement as showing the cost of producing a ton of ore including freight to Cleveland, Ohio, from a mine of 50,000 tons annual capacity, which is on leased ground for a term of fifteen years :

Cost of mining per ton	$2 64
Freight to Escanaba or Marquette per ton.....	1 25
" " Cleveland "	1 25
Royalty.....	50
Interest on $200,000 in machinery. horses, houses, carts, etc., at 10 per cent. on 50,000 tons is per ton.....	40
Discount on 4 months paper received for ore.....	25
	$6 29

The Republic Mine.—The turbine wheels, to be run by the water from the new canal at this mine—have arrived and will be placed in posi ion soon. This experiment is a novel one in this district, but undoubtedly it will prove a success.

Lake Angeline Mine.—A force of eighty men are employed at present in this mine. The company is shipping about 30 car loads per day.

The New York Mine is working 160 men, and shipping five thousand tons monthly.

The Lake Superior Mining Company. have upon their pay roll, for all their different mining locations, four hundred and thirty men, and are shipping daily, about seven or eight hundred tons of ore. The Company have discovered a fine vein of ore in the Bray pit. The new skip was put in motion recently, and quite a number of tons of ore raised.

At the Keystone Mine, about 75 men find employment, and the mine is reported as looking remarkably well. The company have made shipments of about 6,696 tons up to date, and expect to make their shipments up to 10,000 tons during the season. The managers think there will be no trouble in getting out 25,000 tons another year. The new vein or deposit is panning out even better than anticipated, and the ore now being mined is of the very best quality.

Jackson Mine.—Work is being prosecuted vigorously at this mine, and many improvements are being made. This is notably the case at No. 7 pit, which the com-

pany are discovering to be a very valuable part of their property. A large body of pure ore is now exposed in this pit. The yield being both hard ore and hematite.

The Michigamme Mine, which is working a force at present of about three-hundred men, is about to increase its force to three hundred and fifty, which number will be retained during the Winter. This company are shipping considerable ore by way of Escanaba. The cars are run to Negaunee on the M. H. & O. R.R., and there transferred to the C. & N. W. R'y, and sent to their destination. About twenty cars go this way daily.

The Edwards Mine has eighty men employed at present, and is shipping from fifteen to twenty cars of ore per day.

Minnesota Mine.—The new vein at this mine is hardly looking so well as at first reported. Another shaft is being sunk on it at another point.

The New England Mine is so far pumped out that they have commenced carting out the dirt washed in from the banks and will soon begin taking out ore. This mine was at one time considered to be one of our best hematite mines, and has produced, since its opening in 1866, to its shutting down in 1873, 108,990 tons of first class ore.

The Washington Mine, which has recently been leased, is now employing about forty men. The work of pumping out the mine will soon be completed, when mining will be commenced. The company expect to ship a considerable quantity of ore before the closing of navigation this season.

Cleveland and Jackson Iron Companies.—These Companies are to sink a shaft or a series of shafts at the point of juncture of the two properties to ascertain, if possible, whether the Negaunee and Ishpeming deposit of ore are continuous, or simply basins or large pockets.

The Cleveland Hematite Mine is a recent discovery. The company have uncovered the vein to the width of about 35 feet, and have found neither foot nor hanging wall. They are working on a stope of about 8 or 10 feet in which the ore is perfectly free from rock. They have already about 750 tons in cars.

Cleveland Mine.—Work is being prosecuted in a lively manner at this mine, about 350 men being employed.

McComber Mine.—Some fifty men are now employed at this mine, and the force is to be increased. By reference to our tables of shipments it will be seen that this company has shipped 14,670 tons of ore thus far this season, which amount will be considerably augmented before the close of Navigation. No. 2 pit, which has been filled with water since 1873, is being pumped out, and mining will be resumed there at once. The company are sinking test pits on various unexplored portions of the property, with a view to ascertain the full extent and value of the mineral deposit The mine will be worked during the Winter.

The Shenango Mine is working fifty men and shipping about twenty-five cars daily. Their new pockets are nearly completed, and everything being put into good shape. The ore from this mine is very heavy for hematite, the return weight of some of the cars being over 20,000 pounds to the car.

The Winthrop Mine.—The reported discovery of hard ore at this mine turns out to be a solid fact. A force of seventy-five men is employed. This mine produces both hard and soft ores; 14,381 tons of ore have been shipped this season, which will be materially added to before the close of navigation.

The Parsons Mine is located in section 21, T. 47, R. 27, and is the property of the Lake Superior Iron Company. A wooden lander is being constructed, which is to carry the water from the east side of section 15, south-westerly, about 2,000 feet, with a fall of 10 feet. The water is to run a turbine wheel. The wheel is to be located seven hundred feet from the mine, in the south-east corner of section 16. The maximum fall of the water from dam to wheel, will be 36 feet. The power is to be transmitted to the mine by means of wire ropes. There is no doubt but what this work will prove to be the most economical means of furnishing power for the mine, and is another indication that the abundant water powers which this country affords will be eventually utilized.

The Salsbury Mine.—This is said to be the finest bed of hematite on Lake Superior. It is free from rock, a very large vein, and is mined very easy, pick and shovel only being used It is the property of the Iron Cliffs Company, and is shipping 35 cars per day, and employing about 60 men.

The Cambria Mine is working only the hematite pit now, which is a very fine ore and easily taken out. They will not do anything at the hard ore pit until they get their machinery in. The vein in this mine is fully forty feet wide, the quality being the finest and very dark, almost black hematite. From 75 to 100 tons are being taken out daily.

The Bessemer Mine has a very large vein of hematite, which nearly resembles the Jackson hematite, carrying a very large amount of ore, and is free from rock and easily worked. They are shipping from 16 to 20 cars per day, with ten men all told.

The Humboldt Iron Company is suffering a good deal of inconvenience in the shipment of ore. At the bottom of the mine there is from five to fifteen feet of ice. There have to be tramroads cut through the stopes and the ice hoisted. There is ice enough in the mine to supply all the ice consumers in the county next Summer.

The Menominee Furnace has started up. There are well on to 300,000 bushels of coal on hand, which, with the kilns all running, is practically an inexhaustible supply for any ordinary run.

The Morgan Furnace is having a good run at present, averaging about twenty-two tons per day. There is about 100 000 bushels of coal braze on the bank and it is being screened for use, which will be a good saving in the way of fuel. The furnace is now using one-fifth braze. About fifty men have been put to work chopping wood and burning coal, and the prospects are that the furnace will run all Winter. The founder says that they can sell the iron faster than they can make it, which speaks well for the quality of the iron made.

The Cleveland Rolling Mill Company, which are the principal owners of the Saginaw Mine, are working about 2,500 men, and they have a larger stock of iron on hand than they ever before had at one time. At their mill at Newberg they recently turned out, in 24 consecutive hours, 800 rails of 60 lb. to the yard.

Pioneer Furnace.—Both stacks of this furnace have been blown out, and all work in connection with them suspended. The cause assigned for this action is the poor demand for iron, the company having in the neighborhood of 15,000 tons on the bank, for which they are unable to find a market. This movement on the part of the company will be the means of throwing a great many men out of employment, but they can obtain work at other places, as nearly all the mines in the county want to increase their present forces.

At the Rolling Mill Furnace they are now making thirty-five tons of No. 1 foundry iron per day. The former product was twenty tons per day.

Marquette and Pacific Rolling Mill Company.—This furnace has been in blast since September, 1874, or over two years. The first year, working on No. 1 specular and hematite ores, the average per month was over 1,000 gross tons. From October, 1875, to April, 1876—six months—5,249 gross tons was made, or an average of 875 tons per month; from April, 1876, to October, 1876—six months—5,025 gross tons, or an average of 837 tons per month. Taking into consideration that seventy per cent. of the ore used was hematite, fifteen per cent. No. 2 specular, fifteen per cent. No. 1 specular, and the iron made was nearly all No. 1 Bessemer, and has been sold for as high a price as any iron in the market, the furnace has worked very well. Since the present founder has taken charge of the furnace it has made an average of 1,000 tons per month of a very uniform quality of No. 1 Bessemer iron.

MINING NOTES.

OLD SHAFTS.—Quite a number of the old shafts in and around Virginia City are caving in.

GOLD-BEARING QUARTZ has been discovered east of Owens River, eighteen miles north-east of Independence, in Inyo County, California.

THE SUMMIT COAL MINE is located near Livermore, California. The work on this mine is progressing finely. The coal is improving as the workmen advance.

EL DORADO COAL COMPANY, NEVADA.—The shaft of this mine is now down 530 feet. The last 30 feet has been passing through fine clay containing streaks of carbon. This is an immense body of clay, and the indications are that a stratum of fine coal lies under it.

EXPLOSION OF FIRE DAMP.—By the explosion of fire damp in the Wadesville shaft, at St. Clair, Pa., on the 30th ult., three men were severely burned. It is thought they will all recover. Considerable damage was done by the falling of a mass of coal and dirt, and it will take several days to repair and resume mining.

LACKAWANNA IRON AND COAL COMPANY.—The upper rolling mill of this company partially resumed work on the 23d ult., and began the manufacture of iron rails on the 26th ult. Some twenty furnaces were also started in the puddling mill, which had lain idle for a year or more. It looks as though this might be the beginning of a Winter's job for the men who stand very much in need of it.

CALIFORNIA COAL MINERS' STRIKE. All matters have been amicably adjusted between the coal companies of Somersville and Nortonville and the employees. A settlement was made, paying the full price up to the 15th ult. from which date, the established price per yard will be 25c. less than formerly. All the mines have resumed work. It is believed the companies were compelled to make this reduction, in order to make a living profit, owing to the great competition in the coal traffic.

COLORADO COKE.—Arrangements have been made to send coke from Trinidad to Salt Lake, for smelting purposes, at $12 a ton which will be against $25 a ton for coke from Pittsburg. Utah has used about $300,000 worth of Pittsburg coke every year, and now Colorado will furnish it. The smelting furnaces of Colorado have all been built for using wood and charcoal, but the furnaces now building and to be built hereafter will use coke.

COLORADO.—*Pulaski Silver Mine.*—A large quantity of very fine ore is being taken from this vein for concentration at the mill of the Clear Creek County. The tunnel, which is already driven in over eight hundred feet, is, we understand, to be soon put under contract for completion.

Diamond Tunnel.—A new lode has been cut in the heading 1,150 feet from the mouth of this tunnel, which shows 10 inches of good ore. It is supposed to be a portion of the lode cut 15 feet back, and will not be explored until the great Dives-Pelican vein ahead is intersected.

Bird Lode.—Judge HOOD is running a tunnel to cut this vein, and is now at its foot-wall. The upper workings have produced rich ore, and a good streak may be expected at this depth, 150 feet.

The Gregory Mine at Central is in big pay in its deepest workings. The crevice in the deep shaft is from five to six feet wide, carrying a four feet vein of pay rock.

Caribou Silver Mine, (Boulder County.)—Work has been resumed on this mine. We learn that $60,000 has been deposited in bank as a working capital.

Silver Glance Mine.—This company has been driving a drift east from a point 500 feet inside of the Lane Tunnel, which is now over 100 feet in length. This drift shows a continuous body of ore throughout its entire length, in two streaks, one on the hanging wall one foot thick, and the other on the foot wall 18 inches wide. These vary somewhat in thickness, but are remarkably strong and regular as far as opened. The quality of ore has been improving as the drift was run in, and mill-runs have shown a value of 300 to 800 oz. per ton. The last milled, a three-ton lot, ran 800 oz. No stoping has been done, but when this is begun, the profits of this mine will be something wonderful, even for Democrat Mountain. The Silver Glance is the extension of the celebrated Queen of the West Lode.—*Georgetown, Colorado, Miner*, Oct. 28.

THE BOSTON AND COLORADO SMELTING WORKS are now running seventeen furnaces, making one of the largest establishments of the kind in the world. Thirteen of these are engaged in calcining and special work, and four upon the smelting of gold, silver, and copper ores. Late improvements in the construction of these furnaces have greatly increased their capacity, and reduced the expense of running them, in the matters of fuel and labor. The works will have treated, at the close of the current year, about 18,000 tons of ore. When the furnaces are all in active blast, sixty tons per day are consumed. The product of gold and silver for the year will be about two and a quarter millions of dollars. The shipments for October will exceed $200,000. The product of silver is about 100 per cent. greater than the gold. The supplies come from Rosita, Caribou, Georgetown, and Gilpin. Scarcely anything is sent from Boulder, but the establishment of extensive sampling works at Boulder City by this company, are now in progress, will enable them to treat a majority of the ore produced there.—*Central City Register*, Oct. 21.

CONCENTRATING TELLURIUM GOLD ORES.—So far little or no success has been met with in concentrating tellurium ores. The best machines fail to give satisfaction. It is found that on pulverization, telluriferous minerals break up into an almost impalpable powder long before the other combined minerals or the rock reach that condition. As soon as this material touches the water the tellurium minerals become suspended in it or float, baffling all attempts to separate them from the fluid. It is at this point that all machines so far tried have failed. Some late experiments on this subject point to a way in which this difficulty may be overcome. Let the ores be very fairly pulverized, and then immersed in water in a tank provided with a stirrer, so that the tellurides become thoroughly suspended in the water. When this point is reached let the water be drawn off into large iron pots and evaporated. The result will be two products; one consisting almost entirely of tellurides and very rich, and the other that which remains behind in the stirring vats, being quite free from slimes, and capable of easy concentration in almost any machine.—*Mining Review.*

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending Oct. 28.

Tons of 2,240 lb.	1876.		1875.	
	Week.	Year.*	Week.	Year.*
Wyoming Region.				
D. and H. Canal Co.	55,950	1,581,252	69,986	2,533,818
D. L. and W. RR. Co.	67,936	1,449,361	58,443	2,523,964
Penn. Coal Co	30,208	857,350	32,949	1,136,197
L. V. RR. Co	19,351	779,712	19,347	774,568
P. and N. Y. RR. Co.	447	18,695	594	82,398
C. RR. of N. J.	28,672	1,065,138	59,945	1,149,592
Penn. Canal	16,151	347,464	13,221	251,909
	218,715	6,098,972	254,485	8,452,446
Lehigh Region.				
L. V. RR. Co	96,663	2,188,720	96,650	1,659,020
C. RR. of N. J.	34,568	1,124,818	49,319	587,939
D. H. and W. B. RR.	1,203	35,992	2,613	67,310
	132,434	3,349,530	147,582	2,314,269
Schuylkill Region.				
P. and R. R. RR. Co.	176 310	3,845,624	185,197	3,800,729
Shamokin & Lykens Val.	28,661	777,803	31,003	1,026,461
	204,971	4,623,427	216,200	4,827,190
Sullivan Region.				
Sul. and Erie RR. Co.	353	28,462	712	7,851
Total	556,473	14,100,391	618,979	15,601,756
Increase	—	—	—	—
Decrease	62,506	1,501,365	—	—

* Year beginning January 1st.

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent. of the whole production.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Piedmont Railroads amounts to 465,001 tons, as compared with the corresponding period in 1875.

Belvidere Delaware RR. report.	Week.	Year 1876.	Year 1875.
Receipts of coal at Coal Port (Trenton)	11,781	238,577	150,500
" " " South Amboy	8,534	357,691	204,725
Shipments at Coal Port (Trenton)	11,687	233,271	147,027
" South Amboy	16,886	403,124	276,595

Perth Amboy business:	Tons.
Received for the week	19,977
Shipped for the week	32,139
On hand Oct. 28	37,942

Receipts of Coal at Boston, for the week ending Oct. 27, and years from Sept. 1, 1875 and 1876.

From	Week. Tons.	Previously. 1876. Tons.	1875. Tons.
Alexandria and Georgetown	645	9,352	28,380
Philadelphia	23,521	137,997	191,259
Baltimore	3,289	26,735	36,468
Other places	4,029	57,879	80,147
Great Britain	243	821	704
Nova Scotia	1,292	7 863	9,294

Coal Shipped at Pictou, N. S., for week ending Oct. 21, 1876 ..... 4,294 tons.
Previously exported, since Jan. 1 ..... 147,051 "

Total to date 151,375

The Production of Bituminous Coal for the week ending Oct. 28, was as follows:

Tons of 2,000 lb., except where otherwise designated.

	Week, Tons.	Year, Tons.
Cumberland Region, Md.		
Tons of 2,240 lb.	40,884	1,493,242
Barclay Region, Pa.		
Barclay RR., tons of 2240 lb.	9,297	281,193
Broad Top Region, Pa.		
Huntingdon and Broad Top RR.	3,780	128,388
*East Broad Top	1,194	54,168
Clearfield Region, Pa.		
*Snow Shoe	984	41,281
*Tyrone and Clearfield	30,292	915,052
Allegheny Region, Pa.		
*Pennsylvania RR.	4,032	164,463
Pittsburgh Region, Pa.		
*West Penn. RR	3,804	160,187
*Southwest Penn. RR	989	45,740
*Penn. & Westmoreland gas coal, Pa. RR.	20,619	661,633
*Pennsylvania RR.	9,531	240,245

* For the week ending Oct. 14.

The Production of Coke for the week ending Oct. 14.

	Tons of 2000 lb. Week.	Year.
West Penn. RR.	1,652	38,403
Southwest Penn. RR.	8,710	411,814
Penn. & Westmoreland Region, Penn. RR.	1,587	43,174
Pittsburgh, Penn. RR.	2,131	125,823
Total	14,080	619,214

COAL TRADE REVIEW.

NEW YORK, FRIDAY EVENING, Nov. 3, 1876.

Anthracite.

As was indicated a week ago, there has been a falling off in the demand for all sizes of coal, excepting chestnut, and prices are by no means being maintained.

Our regular quotations will be found elsewhere. The following quotations for Pittston coal at Newburg, are from a circular issued by Mr. A. S. SWORDS:

Lump	$3.00	Egg	$3.20
Steamer	3.00	Stove	4.00
Grate	3.10	Chestnut	3.70

The price quoted for chestnut coal is lower than any portion of this size brought at the last auction sale of Pittston coal, 5,000 tons having been knocked down to Mr. MOORE at $3.75.

Delaware & Hudson stove coal is reported to be still obtainable at $4, although the average of auction sale for this size was $4.04.

The Pennsylvania Coal Company is very decided in its announcement that its circular, bearing date Nov. 1, only contains "present prices," and not prices for the whole of November.

Business has been concentrated, and a large quantity of coal has been produced and sold during the last two months, which must result in a corresponding depression some time during the Winter. With a decreasing demand and a continuation of the present rate of production, stocks must accumulate rapidly. The production last week was 556,473 tons as against 562,988 tons for the previous week, and 618,979 tons for the corresponding week of 1875. The total decrease in production since January 1st, as compared with the corresponding period of 1875, has been 1,501 365 tons. The production from the first of November until the end of 1875 was a very fair one, and at present it looks as though the demand and stocking facilities of the companies would not warrant a similar production during the balance of this year, but that the already large loss of business must be made still greater.

Bituminous.

The Cumberland trade moves along with hardly a feature worthy of note. The production last week was but a little over 5,000 tons short of the corresponding week of 1875. The total loss of trade since January 1, as compared with the corresponding period of last year, has been 465,000 tons or over 24 per cent. The Clearfield Region has had its business interfered with by the Centennial travel on the Pennsylvania Railroad, although our last report (October 14) to hand shows the extraordinarily large week's shipments of 30,290 tons, and an increase of business since January 1, as compared with the corresponding period of 1875 of 182,655 tons, or 25 per cent. The miners of this region struck for higher wages upon the 1st inst., but resumed work yesterday upon the old wages.

Wholesale Prices of Anthracite Coal for Nov., f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Lackawanna and Scranton at Hoboken and Rondout	3 15	3 20	3 30	3 40	4 25	4 00
Pittston at Newburg	3 00	3 05	3 15	3 25	4 10	3 70
Wilkesbarre at Port Johnston	3 25	3 25	3 50	3 50	4 25	3 60
Plymouth, R. A.	....	...	3 50	3 50	4 30	3 60
Susque. Coal Co. at Amboy W.A.	3 25	3 25	3 50	3 50	4 15	3 60
Kingston at Hoboken	3 25	3 25	3 25	3 40	4 10	3 75
Lehigh Coals.						
Old Company at Port Johnston	4 00	....	3 60	3 60	4 00	3 60
Old Company's Room Run "	4 00	....	3 60	3 60	4 00	3 60
Sugar Loaf, Hobok. & Amb. "	4 00	...	3 60	3 60	4 00	3 60
Lehigh Coal Exchange "	4 00	....	3 60	3 60	4 00	3 60
Honey Brook Lehigh	4 00	....	3 60	3 60	4 00	3 60
Beaver Meadow at South Amboy	4 00	....	3 60	3 60	4 00	3 60
Schuylkill Coals at Philadelphia.						
Schuylkill white ash	3 20	3 20	3 20	3 20	3 70	3 45
Schuylkill red ash	...	...	....	....	3 30	3 80
Lorberry	....	....	....	4 20	4 20	3 25
Lykens Valley	....	....	....	4 70	4 70	3 70
North Franklin red ash	....	....	....	4 20	4 20	3 25

‡ Boats towed by the D. & H. C. Co. at its expense to and from New York harbor.

Per ton.

Freight from Hoboken and Weehawken to New York .... 45c.
" " Elizabethport & Port Johnston to N. York. 45c.
" " South Amboy to New York ..... 45c.

Freight by the boats of the companies from Hoboken, Port Johnston, Weehawken, Rondout, South Amboy and Perth Amboy to New York City and vicinity 50c

Freight by the Pennsylvania Coal Company's boats from Newburg to New York 65c.

Lackawanna coal delivered to carts in New York or Brooklyn, 50 cents per ton additional.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 70	$6 00
" " at S. Amboy	5 50	6 00
Red Bank Cannel Pa. at Philadelphia	8 00	8 50
" " South Amboy	50	....
" Orrel	00	6 50
Youghiogheny, Waverly Co., at Balt.	4 25	5 65
Despard, West Va.	4 50	6 00
Murphy Run, West Va., at Baltimore	4 50	5 85
Fairmount, West Va., " "	4 40	5 70
Newburgh Orrel, Md. " "	4 50	6 00
Cannelton Cannel, W. Va.	....	10 00
" Splint, " at Richmond.	5 50	7 00
" Gas Coal at Richmond.	4 15	5 65
Peytona Cannel W. Va at Richmond	....	10 00
Manufacturing and Steam Coals.		
Cumberland at Georgetown and Alexandria, Va	3 50@3 75	4 90
Cumberland, at Baltimore	3 65@3 80	5 10
Clearfield f.o.b. Canton, Baltimore	3 40@3 65	5 25

Pennsylvania Semi-Bituminous Coals.

At the mines, per 2,000 lb., 90c. f.o.b. at Greenwich, Phila., for Eastern and Foreign shipments, per 2,240 lb. $3 25@3 40 for Sound ports, 3 50@3 65, through Delaware and Raritan Canal, for points on Hudson River, $3 80 f.o.b., at South Amboy, N.J., per 2,240 lb., $4 50@4 70. Discharged, in New York, per 2,240 lb., $5 00@5 25.

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	9/6@11/	6 50@7 00
Liverpool House Orrel, at Liverpool	26/	13 00
Ince Hall Cannel "	42/	18 00
" Gas Cannel "	28/	13@14
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S.	2 00	4 75
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 50	4 25
Lingan, at Lingan Bay	1 75	....
Sydney, International and Reserve mines, at Sydney	2 00	5 50
Pictou, Albion & Vale mines, at Pictou.	2 25	5 75

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove.	Chestnut
Pittston coal, in yard	$4 20	$4 50	$3 80
Lackawanna coal, in yard	4 20	4 50	3 80
Wilkes-Barre, delivered	5 00	5 30	4 60
Lehigh & Locust Mountain, del'd	5 50	5 50	5 00
Schuylkill Red Ash, del'd	6 00	6 00	5 50

The Cost of delivery for Pittston and Lackawanna coal ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb.	$18 00
Liverpool House Cannel " " "	22 00
American " " " "	13 00
Cannelton Block, or splint, " " "	10 00
American Orrel " " "	11@14
Red Bank Cannel " " "	10 00
Cumberland " " "	7 00

Baltimore, Md. Oct. 30, 1876.

Reported by our Special Correspondent.

ANTHRACITE.

Wholesale or Trade Prices per 2240 lb.

Wilkes-Barre "Lee" or "Diamond," Pittston and Plymouth. White ash.	In cars at depot.	By boats afloat.
Lump and steamboat	$3 85	$3 55
Broken	3 85	3 55
Egg	3 85	3 55
Stove	4 35	4 05
Nut	3 85	3 55
Shamokin, (red or white ash), and "Boston," free burning white ash,		
Egg	4 10	3 80
Stove	4 35	4 05
Lykens Valley, red ash,		
Egg and stove	5 35	5 05

From wharf or yard, wholesale, 50@75c. additional.
By retail, all kinds and sizes, per 2240 lb. ..... $6 00@7 50

BITUMINOUS.

George's Creek, Cumberland f. o. b. at Locust Point	3 75@4 00
West Virginia Gas f. o. b. at Locust Point	4 50
Youghiogheny Gas, f. o. b. at Locust Point	4 50
Swanton	4 00

Boston. Oct. 28, 1876.

THE demand at retail increases, and bids fair to be sufficiently full to encourage the yard men to advance quotations by the first of November about 25c. per ton. The sales in New York, both last and this week, have been quite encouraging to holders of household sizes, and suggests that the retail dealers everywhere are as moderately supplied as they are just now in Boston. The rapidity of the sales the past two months suggests what confidence from the public in the prices given will do. At least 350,000 tons of coal have been distributed from local and near-by towns, wharves to the cellars and sheds of consumers. There is hardly so sharp an inquiry for manufacturing purposes from the pockets as has been current the past five weeks; the rains of the last fortnight have supplied considerable power to supersede steam. The inquiry for cargoes has been fair and prices are full.—*Commercial Bulletin.*

Buffalo, N. Y. Nov. 1, 1876.

Reported by LEE & LOOMIS.

Deliv'red at	Elmira. Afloat.	Ithaca. Afloat.	Syracuse Afloat.	Rochester. Afloat.	Rochester. ret. del.	Oswego f.o.b.
Grate	$4 20	$3 45	$3 60	$4 30	$5 55	$4 55
Egg	4 20	3 55	3 70	4 40	5 65	4 65
Stove	4 60	4 05	4 20	4 90	6 15	5 15
Nut	4 35	3 80	3 95	4 65	5 90	4 90

Delivered at	Erie. f.o.b.	Buffalo. Afloat.	Buffalo. f.o.b.	Buffalo. ret. del.
Grate	$5 05	$4 55	$5 05	$5 80
Egg	5 15	4 65	5 15	5 90
Stove	5 65	5 15	5 65	6 40
Nut	5 40	4 90	5 40	6 15

Chicago, Ill. Oct. 30, 1876.

Lackawanna Stove	$7 00
" Chestnut	7 00
" Grate and Egg	7 05
Erie and Brier Hill	5 25
Wilmington and Illinois	4 75@4 25
Blossburgh	7 50

Cincinnati, O. Oct. 30, 1876.

Reported by our Special Correspondent.

Per ton of 2000 lb.	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	@8c.	——
Pomeroy coal "	@5c.	——
Kanawha " "	7½c.	——
Ohio River Coal "	5½c.	——
Cannel coal, according to quality "	@16c.	——

The following are the retail prices delivered

Youghiogheny	1c@11c.
Pomeroy	9c.
Cannel	@22c.
Kanawha	10c.
Anthracite, per ton	$9 00
Coke, at yard	10c.
Coke, hard and soft, delivered	— @9c.

Cleveland, O. Oct. 30, 1876.

Specially reported by Messrs. LAMBIE & BATES.

Per ton of 2000 lb. f. o. b. vessels.

WHOLESALE.

	For vessels,	On cars.
Youghiogheny Gas Coal	$4 10	$4 00
Cannel	4 25	4 15
Blossburgh	$5 00	$5 00
Briar Hill, Block Coal	3 50	3 25
Straitsville Coal Co., lower vein	2 90	2 90
" " " whole "	2 80	2 80
Hocking Valley	2 90	2 90
Massillon	2 90	3 00
Tuscarawas Valley	2 50	2 50
Columbiana	2 50	2 50

CLEVELAND COAL EXCHANGE PRICES UNTIL FURTHER NOTICE.

	1 to 10 tons.	10 tons upw'd.
Brier Hill lump	$4 25	$4 00
" " nut	3 75	3 50
Massillon and Mineral Ridge lump	4 00	3 75
" " " " nut	3 75	3 50
Straitsville Lower Vein, Hocking & Shawnee, l'p.	3 60	3 35
" " " " nut	3 40	3 15
Del Carbo lump	3 75	3 50
" " nut	3 50	3 25
Rich Hill lump	3 60	3 35
" " nut	3 25	3 00
Maple Hill lump	3 50	3 25
" " nut	3 25	3 00
Columbiana, lump	3 25	3 00
" nut	2 75	2 50
Lacka'a., Wilkesbarre and Pittston egg and grate,	6 25	6 05
" " " stove	6 75	6 50
" " " chestnut	6 50	6 25

Lehigh to be $1 25 per ton higher.
All sales to be strictly cash with order or C. O. D.

Indianapolis, Ind. Oct. 30, 1876.

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers. Per ton of 2000 lb., bushel of 70 lb.

BITUMINOUS.

White River, per ton	$2 50	Peytona cannel, per ton.	5 75
Brazil Block, "	2 50	Indiana Cannel	4 50
Highland, grate, "	2 25	Hocking Valley	4 25
Block coal, nut, per car	18 00	Youghiogheny	4 50
Highland " "	18 00	Blossburg (smithing)	6 50
Block Slack "	17 00	Piedmont "	6 50
		Gas coke, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre.)

Broken	$8 35	Nut	8 50
Egg	8 35	Stove	8 75

Lehigh Anthracite.

Broken	9 75	Nut	9 50
Egg	9 75	Stove	10 00

Retail, per bushel, delivered.

Sand Creek	15c.	Block Nut, steam	8
White River	13	" Slack, "	7
Brazil Block	14	Peytona Cannel	28
Highland grate	13	Virginia "	27
Block Nut, domestic use	12	Youghiogheny	20
Highland Nut, "	12	Blossburg	26
" " steam	8	Piedmont	26

GAS COKE (measured.)

Crushed	15c.	Lump	12c.

ANTHRACITE,

Wilkes-Barre and Lackawanna (all sizes) $9 75 per ton.
Lehigh, retail $11 50 per ton.

Louisville, Ky. Oct. 30, 1876.

Specially reported by Messrs. BYRNE & SPEED.

Please report our prices as follows;

WHOLESALE.

	per bushel		per bushel
Pittsburg	6½c.	Pine Hill	—
Raymond City	6½c.	Kentucky	7c

RETAIL.

	per bushel		per bushel
Pittsburgh	10c.	Peytona Cannel	18c.
Raymond City	10c.	Buckeye "	
Pine Hill	13c.	City-made Coke	8c.
Kentucky	9c.	Anth., per ton, $10 00 to 10 50	

Screened Pittsburgh per load $3 50
Screened Raymond City 2 50
Pine Hill (Kentucky) 2 25
Cannel 4 50
City-made Coke 4 00

Milwaukee, Wis. Oct. 30, 1876.

Specially reported by Messrs. R. P. ELMORE & Co.

Trade is quiet. Our prices for coal are:

Retail price per ton of 2000 lb.

Lehigh Lump	$9 00	Briar Hill, select	$7 00
Lehigh Prepared	9 50	Blossburgh	7 00
Lackawanna (all sizes)	8 50	Cannel	8 00
Pittston	8 50	Pittsburgh	6 50
Scranton	8 50	Steam coal	5 50

New Orleans, La. Oct. 26, 1876.

Reported by C. A. MILTENBERGER & Co.

Pittsburg coal, wholesale, by boat-load, per bbl. 27@28c
" steamboats, per bbl 40c.
" to manufacturers 45c.
" shipments, per hhd $5 25
Anthracite, wholesale, per ton 8@8.50
" retail, " 12@13
Virginia Cannel, per bbl 80c.
Scotch " " 80c.
Mt. Carbon, wholesale, per bbl ...
" " retail, " 50c
St. Bernard wholesale, per bbl 25c.
" steamboat 35c.
" retail, " 45c.

Pittston, Pa. Oct. 30, 1876.

Pennsylvania Coal Company's Coal in yard, ton of 2000 lb.

Retail.

Lump, Egg and Stove $2 25
Chestnut 2 00
Delivered, fifty cents per ton additional.

Richmond, Va. Oct. 30, 1876.

Specially reported by S. H. HAWES, Dealer in Coal.

Prices are now as follows:

Per ton of 2240 lb., f.o.b.

Kanawha Cannel	$9 00	New River Bituminous,	$4 00
" semi-Cannel	4 00	Clover Hill Coal	3 50
Coalburgh Splint	4 00	James River Bitum	3 30
Lewiston "	4 00	" " Carbonite,	5 00
Kanawha Gas coal	3 90		

San Francisco, Cal.

From the *Commercial Herald*, Oct. 26, 1876.

Imports from Jan. 1st to Oct. 16:

	tons.		tons.
Anthracite	10,571	Vancouver Island	79,803
Australian	100,215	Rocky Mountain	163
Coos Bay	31,111	Seattle	72,189
Cumberland	9,251	Bellingham Bay	16.395
English	64,803	Chili	2,076
Mt. Diablo	86,408		

No sooner does the California Mt. Diablo mines resume work than a telegram reaches us from British Columbia that the Wellington mines are fired. Since this announcement the wires have been down, and we are not advised as to the extent of the damage. The Seattle Mines, Washington Territory, are not now producing as much as they were early in the season, and this applies to both the Bellingham Bay and Coos Bay Mines, owing of course to the very abundant foreign supply in market and the continued low prices ruling in this city. The arrivals during the month have been large and numerous, and for the period under review embrace the following cargoes: *Belfast*, 2,400 tons, Newcastle, N.S.W.; *North Wales*, 1,507 tons, same; *Osseco*, 823 tons, same; *Arundel Castle*, 1,282 tons, same; *Duchess of Argyle*, 2,273 tons, same; *Raglan Castle*, 1,500 tons, Sydney; *City of Benares*, 700 tons, Australia; *Duke of Athol*, 1,149 tons, Sydney; *John O'Gaunt*, 1,626 tons, ditto; *Buckinghamshire*, 1,600 tons, Wallsend, via Astoria; *Bayard*, 1,763 tons, Newcastle, N.S.W.; *Tabor*, 1,693 tons, Liverpool; *Rosewell*, 1,706 tons from Shields; *Cape Sable*, 1,700 tons, Ardrossan; *Semiramis*, 1,500 tons, Newcastle, Eng.; *Henry Buck*, 1,060 tons, Nanaimo; *Ivanhoe*, 171 tons, Coos Bay; *Medea*, 693 tons, Sydney; *Lookout*, 1,340 tons, Bellingham Bay; *Germania*, 1 400 tons, same; *Marmion*, 1,300 tons, Seattle; *J. B. Bell*, 1,200 tons, ditto; *Harvest Home*, —— tons, ditto. In the absence of reported sales it is difficult to give actual quotations, but we remark that the bulk of the arrivals noted were placed prior to their appearance here, and in a few instances cargo sales have been made from second hands at 25 cents per ton advance on the rate of first purchase. We quote Australian, $7.75@8.25; English and Scotch steam, $7.75@8; anthracite, $12@15; Cumberland, $14@16; Seattle, $9; Coos Bay, $8.

St. Louis. Oct. 30, 1876.

Reported by JAS. J. SYLVESTER, Secretary of the Anthracite Coal Association.

Retail prices, delivered.

ANTHRACITE. per ton.

Lackawanna	$9 00@10 00
Wilkes-Barre	9 00@10 00
Schuylkill	9 00@10 00
Lehigh	11 00@12 00

BITUMINOUS.

Blossburg	9 00
Pittsburg	4 50
Indiana Block	4 00
Big Meadow	3 00
Illinois Coals	2 50@3 00
Connellsville Coke	9 00

Toledo, Ohio. Oct. 29, 1876.

Specially reported by GOSLINE & BARBOUR.

We quote as follows for retail delivery:

Lackawanna lump	$6 75	Lehigh lump	$7 75
" egg	6 75	" egg	7 75
" stove	7 00	" stove	8 00
" chestnut	6 75	" chestnut	7 75

Soft Coal.

Hocking lump	4 00	Brier Hill	5 75
" nut	4 00	Blossburg	8 00
Willow Bank lump	4 50	Cumberland	8 00
" " nut	4 00		

Montreal. Oct. 30, 1876.

Specially reported by Messrs. ROBERT C. ADAMS & Co.

Wholesale per ton of 2240 lb.

Scotch Steam	$4 25	Cape Breton Steam	$3 75
Pictou "	4 25	Newcastle Smiths	5 50

Anthracite at retail, per 2000 lb., delivered.

Egg	$6 25	Chestnut	6 25
Stove	6 75		

Hamilton, Ont. Oct. 30, 1876.

Specially reported by H. BARNARD, Dealer in Coal.

Grate	$5 75
Egg	5 75
Stove	6 00
Nut	5 75
Lehigh Lump	6 50
Smithing	6 00
Bituminous, retail	5 50
" steam	4 00
Coke	6 75

Rates of Transportation on Anthracite Coal to Tide Ports.

Lehigh and Wyoming Coals.

per ton of 2240 lb.

	From Penn Haven.	From Mauch Chunk.	From Hazleton**	From Upper Lehigh.	From Ashley and Sugar Notch.
To ‡ Newark, N. J. (117 miles), via Central Railroad of New Jersey	1 62	1 48	2 04	1 95	2 18
‡ Mauch Chunk, Pa., via Central Railroad of N. J.	16	..	58	49	72
‡ Philipsburg, N. J., (46 miles)	58	....	1 00	9	1 14
Elizabethp't, (114 m.) Pt. Johns., Hoboken & South Amboy, N. J., shipping and wharfage 35c. add.	1 26	44 1 12	1 68	1 59	1 82
High Bridge, N. J.	1 95	1 75	2 43	2 34	2 52
Elizabeth, Cranford, Westfield & Elizabethport, for consumption,	1 89	1 75	2 31	2 22	2 45
Jersey City, N. J., (121 miles) and New York, via L. V. RR.	1 59	1 45	2 01	1 92	2 15

From *Mauch Chunk* to *New York* (121 miles), (towing limits) and Jersey City† via Lehigh Valley RR. $1 44
From *Mauch Chunk* to *Philadelphia* (93 m.) via L. V. and L. and S. RR. and North Penn. RR 1 25
From *Phillipsburg, N. J.* to *Hoboken* (84 m.) for shipment via Delaware Lackawanna and Western RR., Morris and Essex Division 65
From *Phillipsburg, N. J.*, to *Newark* (75 m.) via Delaware, Lackawanna and Western RR. 1 01

** Rates on line coal from Hazleton are 10c. per ton above these figures.

‡ The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from Mauch Chunk to Phillipsburg for way points will be $1 15 per ton.

† Transportation on Coal destined for re-shipment from this point is 20c. less than above rate.

The distances in the above table are Computed from *Mauch Chunk*. From *Ashley* to *Mauch Chunk* the distance is 51 miles, and from *upper Lehigh*, 33 miles. From *Hazleton* 24 miles, and from *Penn Haven* 8 miles.

From *Wilkes-Barre* to *Perth Amboy* via the Lehigh Valley Railroad Company, the distance is 161 miles, and from *Mauch Chunk* it amounts to 106 miles.

Geneva, Ithaca and Sayre Railroad.—The rates of transportation on coal from Coxton, Pa., per ton of 2.240 lb., from and after the first of November, will be as follows:

To East Waverly, N. Y.	$1 75
" Ithaca, and for C. Lake RR. (local)	1 64
" " for C. Lake RR., and via Erie Canal (shipment)	1 56
" To Van Etten, for U. I. and E. RR	1 61
" Geneva (local) for S. P. and S. and L. O. S. Railroads, and for N. Y. C. and H. R. RR, except Auburn and Cayuga	2 06
To Geneva, for Buffalo and Towanda	1 85
" " " Rochester and Charlotte	1 99
" " " Auburn and Cayuga	2 50
Total rate to Buffalo	3 47
" " " Rochester	2 75

REGULATIONS.

A charge of fifteen cents per ton will be collected of each consignee on all coal not unloaded within twenty-four hours after its arrival, and an additional charge of ten cents per ton for every twenty-four thereafter; Sundays and legal holidays excepted.

No allowance will be made for coal lost from cars on account of bro ken doors or other defects existing when the cars are loaded.

All freights will be collected weekly, by drafts on shippers, from Coxton to destination.

Freights

Representing the latest actual charters up to Nov. 2, 1876.

Per Ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me	....	....	....	....
Albany	....	....	....	....
Alexandria	....	....	....	....
Amesbury, Mass	....	....	....	1 75
Bangor, Me	....	....	....	1 50
Bath, Me	....	2 50	2 30	1 50
Baltimore	....	....	....	....
Boston, Mass	1 80@2 00	2 25	225-30	1 50
Bridgeport, Ct	1 15†	1 85	1 90	80
Bristol, R. I.	1 60	....	....	1 00
Cambridgeport, Mass.	2 00@2 10	....	....	1 50
Derby	....	....	....	....
Dighton	....	....	....	....
East Cambridge	2 00@2 10	....	....	1 50
Fall River	1 60	1 90	2 00	1 00
Hackensack	1 12†	....	....	....
Hallowell, Me	....	....	....	....
Hartford	1 75@2 00	2 50	....	1 00
Hoboken	†95	....	1 55	45
Hudson	1 10	1 90	....	....
Jersey City	†95	....	1 55	45
Lynn, Mass	....	....	....	†1 50
Middletown	1 75@2 00	....	....	1 15
Mystic	....	....	....	....
Newark	†96	1 60	....	....
New Bedford	1 75	2 00	2 00	1 15
Newburyport	2 00	2 50	2 30	1 70
New Haven	1 10†	1 85	1 90	80
New London	1 60	1 90	2 00	80
Newport	1 60	....	....	1 10
New York	†95	1 60	1 65	45
Norfolk	....	....	70	75
Norwalk	1 10†	1 90	....	80
Norwich	1 60	1 90	....	1 00
Pawtucket	1 75	2 00	....	‡1 10
Philadelphia	....	1 00	....	....
Portland	2 00@2 15	2 25	2 30	1 35
Portsmouth, N. H.	2 00@2 10	2 50	2 40	1 70
Providence	1 60	1 90	2 00	1 10
Poughkeepsie, N. Y.	1 10†	....	....	....
Rockport	....	....	....	....
Saco	....	....	....	....
Sag Harbor	....	....	....	....
Salem, Mass	2 10@2 15	2 50	....	1 50
Salisbury Pt., Mass.	....	....	....	....
Stamford	1 10†	....	....	....
Stonington	....	....	....	....
Taunton	..	....	....	....
Troy	1 15†	....	....	....
Warren, R. I.	....	....	....	1 10
Wareham	....	2 00	2 20	....
Washington	....	....	....	....
Weymouth	....	....	....	....
Wilmington, Del	....	1 00	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c. per bridge extra.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Nov. 3, 1876.

American Pig.—Buyers have become aware of that which we intimated a week ago, that one of the prominent Lehigh companies is selling No. 1 foundry iron at $21 — which has had the effect of very much unsettling buyers' views. There is another very demoralizing feature—an inclination to put in blast a number of furnaces. The demand for iron is very quiet, and is likely to continue so during the time that navigation will be closed. There are indications, however, that there will be a larger demand for iron during next year than there has been this year; but if the furnace companies, with a large surplus producing capacity, are too prompt to anticipate the wants of the country, they will make worse a situation already bad enough. We quote No. 1 foundry iron at $21@$22; No. 2, and forge, $19@$20.

Scotch Pig.—The business in this article has been entirely in a retail way. We quote according to quantity, as follows: Eglinton, $26@$26.50; Glengarnock, $27.50@$28; Coltness, $28.50@$29.

Messrs. JOHN E. SWAN & BROS., Limited, of Glasgow, under date of Oct. 20, report 118 furnaces in blast as against 116 a year previous; pig iron in CONNAL & Co's stores 94,206. an increase of 908 tons during the week, as against 73,137 tons at the corresponding time in 1875; shipments for the week ending Oct. 14th, 11,049 tons as against 9,723 for the corresponding week of last year; total decrease of shipments this year, as compared with last, 72,704 tons. They quote No. 1 pig iron as follows: Gartsherrie, 65/; Coltness, 69/; Summerlee, 63/6; Langloan, 66/; Glengarnock, 64/; and Eglinton 57/. They quote freights as follows: to New York, 2/; Boston, 9/; New Orleans, 5/; Baltimore, 8/; Philadelphia, 7/6; Montreal, 10/; San Francisco, 22/6.

Rails.—We are reported a sale of 1,500 tons of iron rails on private terms. We quote iron rails, at mills, at $36@$42, and steel at $52@$54.

Old Rails.—We are not reported any business in these which are quoted at $20.50.

Scrap.—No. 1 wrought is quiet and nominal at $27. We note the sale of 150 tons of old car wheels at $20.

Philadelphia Iron Trade.

Weekly report of the Philadelphia Iron Market, furnished by Messrs. JUSTICE, COX, JR., & CO., Iron Merchants, 333 Walnut Street, Philadelphia. Week ending Nov 2, 1876.

There is nothing new to report this week. Pig iron is moving off in a moderate way to consumers. The tone of the market is a little weak. There is no decided reduction, but the firm feeling manifested for some weeks does not appear so strong. The large companies are firm in price, but the furnaces recently put in blast seem desirous of selling their production even at a shaded price. Forge continues to be the scarcest thing in the market, but even this is more plenty than at our last. We quote No. 1 $22 to $22.50; No. 2, $20 to $20.50; gray forge, $19 to $19 50; favored brands, $21.

MANUFACTURED IRON.—There is a little more doing in bars than at our last, but nothing better as to price. We quote 2.25c. to 2.35c. per lb. Orders for skelp, tank, and sheet iron continue to come in with a firm feeling as to price. Muck bars continue in demand for California shipment. We quote $36 to $39.

RAILS.—There have been several parties trying to purchase iron rails in the last week or two, but as they have only bonds to offer in payment we do not hear of any sales. The steel rail combination talked of, we understand, have not come to terms as yet. We quote iron rails, $38 to $40; steel, $52 to $54, all at works.

SCRAP is quoted $24 to $27. No sales. Cast $14 to $19.

Baltimore. Nov. 1, 1876.

Specially reported by Messrs. R. C. HOFFMAN & Co.

There has been no change in the iron market since our last report. We quote:

Baltimore Charcoal	$30@34	Anthracite No. 3	$20@21 00
Virginia Charcoal	28@33	Mottled and White	17@19 00
Anthracite No. 1	23@24	Charcoal C.B. Blooms	60@65 00
" No. 2	21@22	Refined Blooms	50@55 00

Boston. Oct. 28, 1876.

PIG.—There is little new to note. The demand is of a restrictive character although holders talk rather more confidently. They state that the sales of the past three weeks have been unusually large to all the furnaces; and that the great piles of stock that have marked the Philadelphia stock yards and the Pennsylvania manufacturing localities have been wiped out. Certainly the stocks for the market here are quite small, never before probably so light, but still there is no inducement to fill up. We note car lots ranging from $22 to $25 as to brands and quality.

BAR is selling in a jobbing way with slight increase of business, while the iron for three new vessels has been contracted for during the week, with schedules on two others in the market likely closed late on Friday. The market for common iron is just a trifle steadier while the improvement in the price of refined is noticeable. We quote $49 for refined and $40 for common per ton, quite low, with two dealers indifferent to sell at these prices.

STEEL is moving a trifle more freely than a week ago for machinery purposes, with several large orders reported placed for saw and small edge-tool steel.

We quote American tool 14@15c; American machinery 8@9¼c; Bessemer tires 5¾c; Sweet's Excelsior Tire 7½c; English tool 15½c gold.—*Commercial Bulletin.*

Chattanooga, Tenn. Oct. 31, 1876.

Specially reported by J. F. JAMES pig iron broker, etc., 233 Market Street.

The demand here for all grades has been quite active and far exceeds the supply. Large orders from 300 to 1,000 tons, from the West and North, at fair prices, have been declined, owing to light stocks. If the present demand continues, most of the furnaces adjacent to this market, now idle, will certainly resume. I quote on the usual 4 months' time:

Tenn. Ala. and Ga. Charcoal,	No. 1 foundry	$20@ 21
" " " "	No. 2 foundry	19@ 20
" " " "	gray forge	16@ 17
" and Georgia coke,	No. 1 foundry	18@ 19
" " "	No. 2 foundry	17@ 18
" " "	gray forge	15@ 16
White and Mottled		14@ 15
Tennessee and Georgia cold-blast car wheel		21@ 22
Alabama " "		21@ 22
Old Rails		cash 20 50
Cast Scrap		" 13
Wrought Scrap		" 18@ —

Cincinnati, Oct. 31, 1876.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

Good brands of charcoal irons are getting very scarce, and the demand is increasing. We quote:

CHARCOAL.

Hanging Rock, No. 1 Foundry	$24 00@25 00	—4 mos
" No 2, "	23 00@	—4 mos
" Mill	21 00@	—4 mos
Tennessee, No. 1, Foundry	23 00@24 00	—4 mos
Tennessee, No. 2, "	22 50@23 00	—4 mos
" Mill	21 00@	—4 mos
Missouri, No. 1, Foundry	@	—4 mos

STONE COAL.

Ohio, No. 1, Foundry	22 50@	—4 mos
" No. 2, "	21 00@21 50	—4 mos
Ohio Mill	20 00@21 00	—4 mos
Missouri, No. 1 Foundry	25 00@	—4 mos
" No. 2, "	24 00@	—4 mos
" Mill	23 00@	—4 mos

CAR-WHEEL.

Hanging Rock, C. B	40 00@45 00	—4 mos
Tennessee "	25 00@32 00	—4 mos
Missouri "	32 00@35 00	—4 mos
Alabama "	25 00@32 00	—4 mos

BLOOMS.

Charcoal	60 00@ 75 00	—cash

SCRAP IRON.

Cast	50c.@ 85	—cash
Wrought	1 00@1 40	—cash

Louisville. Oct. 31, 1876.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market is firm for nearly all grades of iron, with a good demand. Most of the sales made are outside figures. We revise quotations as follows.

The usual time, four months, allowed on quotations below.

HOT BLAST—CHARCOAL.

No. 1 Foundry, from Hanging Rock Ores	$24 00@25 00
No. 2 " " "	22 00@23 00
No. 1, Mill, from " "	20 00@21 00
No. 1. Foundry, from Alabama, Georgia and Tennessee ores	22 00@23 00
No. 2, Foundry, from Ala., Geor'a and Tenn. ores	21 00@22 00
No. 1, Mill, from " " " " "	20 00@21 00

HOT BLAST—STONE COAL AND COKE.

No. 1, Foundry, from Hanging Rock Ores	22 00@23 00
No. 2, " " " " "	20 00@21 00
No. 1, Mill, " " " " "	20 00@21 00
No. 1, Foundry, from Ala. Ga. and Tenn. Ores.	21 00@22 00
No. 2, " " " " "	20 00@21 00
No 1, Mill, " " " " "	20 00@21 00
No 1 Foundry, from Missouri Ores	— @ —
No. 2 " " " "	— @ —
No. 1 Mill, from Missouri Ores	23 00@25 00

COLD BLAST—CHARCOAL.

Car Wheel from Hanging Rock Ores	35 00@43 00
" " Tennessee "	26 00@28 00
" " Alabama and Georgia Ores	28 00@40 00
" " Kentucky Ores	28 00@42 00

Pittsburg, Pa. Oct. 31, 1876.

Specially reported by A. H. CHILDS.

This market has had its full share of the prevailing dullness, and during the past week or two sellers have shown rather less firmness than hitherto. Prices are nominally unchanged, but buyers claim that they have been offered concessions on some good lots of iron when holders have been anxious to realize.

No. 1 Foundry	24 00@25—4 mos
" 2 "	22 50@23 00 "
Gray Forge	21 00@22 50 "
White and Mottled	18 00@20 "
Warm blast Charcoal	24 00@28 "
Cold blast Charcoal Western	40 00@45 "

Richmond, Va. Oct. 30, 1876.

Reported by ASA SNYDER, Esq.

Virginia Cold Blast Charcoal Pig Iron			$27 to $33
" Warm " "	"	"	24 to 28
" " " Coke	"	" 1 X	23 to 24
" " " "	"	" 2 X	21 to 22
" " " "	"	" 3	20 to 21
" Anthracite 1 X			— to —
" " 2 X			— to —
" " 3			— to —

San Francisco, Cal.

From the *Commercial Herald*, Oct. 26, 1876.

The receipts of American pig iron from New York during the month have been free, with little demand. The *Cape Sable* from Ardrossan brought 300 tons Scotch pig iron. We have before noted large contract sales of tin plate for next Spring's Salmon trade at $7.50 per box. It is said that sales of Scotch and English, as well as American pig iron, have been made to arrive at $27.50 @28. The last sale of Sydney tin was 18¼c. We quote I. C. Coke, $7.50; I. C. Charcoal, $8.50@9; I. X. ditto, $10.50@11; Roofing plate, $8.25. *The Young America* for New York had 3,653 pigs lead weighing 456,000 lb.

Montreal. Oct. 24, 1876.

During the past week business has decidedly been more active, Pigs moving freely at quotations, stocks are light and the quantity unsold to arrive being very limited, makes the tone of the market at present more firm. Bar iron in good demand and stocks are pretty well assorted. We continue to quote: Pig Iron Eglinton and Clyde; $19@$19.50; Carnbroe $19@$19.50; Summerlee and Calder $20@$21; Langloan and Gartsherrie, $22@$22.50; Coltness, $21@$21.50; Hematite, $26@27. Bar, per 100 lb., Scotch and Staffordshire, $2@2.05; best do., $2.25@2.30. Swedes and Norway, $4.75@$5; Low Moor and Bowling, $6.—*Monetary Times.*

METALS.

NEW YORK, FRIDAY EVENING, Nov. 3, 1876.

THE same dullness observable a week ago has continued during this week, and will probably continue during the greater portion of the Winter, or at least until after the elections are fully over.

Gold Coin.—During the week under review gold has ranged from 110¼ to 109¾, and closed at 109¾.

Bullion.—The market for silver is a little weaker. Our quotation is 116, while London quotes at 53¼@53¼d. San Francisco quotes 12 per cent. discount. Gold is unchanged at par to ¼ per cent. premium.

Copper.—The war prospects having been crushed, considerable tone has been taken out of the market. Buyers are again following the hand-to-mouth policy which they have so persistently adopted during the past two years. The sales during the week have aggregated about 400,000 lb. at 20c. to 20¾c., 100,000 lb. having been sold at the former figure, although the closing quotations are 20¼ @20¼c.

Tin.—This article continues very quiet, and somewhat irregular. We quote Straits at 17¾@17¼c.; L. & F., 17c.; Refined, 17¼@17⅞c.; Banca, 19¼c. By cable, to-day, Straits is quoted in London at £75 10/.

Tin Plates share in the depression which has effected the whole list. The following are the quotations, in gold, per box: Charcoal tins, $6.75@$7, and ternes, $6.25@$6.50; coke tins, $6@$6.12, and ternes, $5.50 @$5.75.

MESSRS. ROBERT CROOKS & Co., of Liverpool, under date of October 19, says of Tin Plates:—"Some business has been done this week in Coke tins, and nearly all the lots that were offering at bottom figures are now cleared off, and most of the needier makers filled up for the next two months. Other descriptions keep very dull, especially Charcoal tins, for which there is little or no inquiry."

Lead.—Missouri soft is quoted in St. Louis at 5·75c., currency, equal to 6·10c. laid down here. Ordinary lead is quoted in this market at 6c.@6·10c., with a decided downward tendency, caused by a very small demand and the knowledge that large quantities of lead are on the way to this port, and that the supplies are likely to continue large.

Spelter and Zinc.—We quote spelter at 6⅛c.@6¾c. currency, with but very little demand. Sheet zinc is quiet at 8¾c.

Antimony.—There is but little doing in this article, which is quoted at 14¼c.@14¾c. gold.

Quicksilver.—The approach of Winter and prospects of bad roads and decreased supplies, have caused quite an advance in this article. We quote at 51@56c. per lb., while San Francisco quotes at 50c. The London quotation still continues at £8.

The San Francisco *Commercial Herald*, of Oct. 26, 1876, says of Quicksilver: The market is strong under more favorable advices from Hongkong. Sales at 45c. to some extent. The *Deux Amis* for Valparaiso carried 265 flasks.

THE SALT LAKE CITY SILVER ORE MARKET.

MR. J. B. MEADER, under date of October 28th, says, "No change to note in the market, although the tendency is downward."

FINANCIAL.

New York Stocks.

NEW YORK, FRIDAY EVENING, Nov. 3, 1876.

OUTSIDE of various rumors of the conclusions arrived at in congress of the trunk lines which has been in session here for the past few days, we have nothing to note worthy of special comment. The quotations are generally lower, and the sales show an increase of about 25,000 shares.

Delaware Lackawanna and Western Railroad.—117,408 shares of this stock have changed hands between 76 and 73⅛, closing at 74⅜, a decline of 1¼ per cent.

The employees of the Scranton shops are still on strike against the reduction of wages, and neither party appears to be disposed to give way. The repair shops at Great Bend, Pa., caught fire on the night of October 28, and were destroyed, causing a loss estimated at $12,000. These shops were of minor importance, and were soon to have been abandoned, and the work taken to the Scranton shops.

In connection with the above, we note the following workmen's view of the question:

"Previous to the strike the average wages of machinists, blacksmiths, and carpenters, was about $2.50 per day, or, in other words, it ranged from $2.25 to $2.75, making the above average. At the same time, the wages of helpers ranged from $1 50 to $1.90 per day. The reduction, if submitted to, would leave first class mechanics from $1.25 to $1.40 per day of ten hours. The shops have been working only eight hours for some time, which still further reduces the pay of the men. The helpers will, at the wages at present offered by the company, have $1 per day of ten hours, or eighty cents under the present eight hour system.

New Jersey Central Railroad.—About 35,000 shares of this stock have changed hands between 38 and 35, closing 2¼ per cent. below the higher figure. It is rumored that Mr. EDWARD W. CLARK, President of the Lehigh Coal and Navigation Company, is possibly to succeed Mr. KNIGHT as President of this company. Mr. CLARK is well and favorably known, and justly enjoys a large share of public confidence.

Delaware and Hudson Canal Company.—About 4,000 shares of this stock have changed hands between 74 and 71¼ closing at 73 per cent. The directors of this company, in connection with the Vice-president of the Erie Railroad, have been over the Hoosac Tunnel and Fitchburg Railroad, and negotiations are pending looking to a freight and passenger combination between these corporations.

Albany and Susquehanna Railroad.—The London Stock Exchange Committee have ordered the seven per cent. first consolidated mortgage bonds. (Nos. 501 to 1,500 inclusive) of the Albany and Susquehanna Railroad Company to be officially quoted. This is equal to $1,000,000, the par value being $1,000. The total amount of this issue outstanding is $1,595,000.

Maryland Land and Mining Company.—This stock closes lower. 300 shares sold during the week between 5⅛ and 6¼.

Maryland Coal Company.—We note sales of 100 shares of this stock at $9⅛ per share. This company announces that it will receive proposals from the 1st to the 10th inst., inclusive, for the purchase of its first mortgage sinking fund bonds for cancellation, for which purpose ($10,000) ten thousand dollars have been deposited with the Farmer's Loan and Trust Company (Trustees). This is the second proposition of this character since the incoming of the present administration, and in view of the depressed condition of the Cumberland coal trade, it indicates great economy in the management.

Richmond and Three Forks Railroad.—It is thought that this road will be built before long. The Louisville and Nashville Company has promised aid, provided the Counties of Madison, Estill, and Lee will assist to a reasonable amount. It is also thought that some help can be secured from Louisville. The road is to be an extension of the Louisville and Nashville's Richmond Branch from Richmond, Ky., eastward to the Three

Forks of Kentucky 44¼ miles. The road will tap an extensive lumber country, and will give access to large deposits of coal.

Coupons and Interest are due on the bonds of the following companies during the present month:

Buffalo Union Iron Works.—Coupons.

Central Railroad of New Jersey.—Coupons on the convertible bonds of 1902.

Cumberland and Pennsylvania Railroad.—2d mortgage coupons paid by the Consolidation Coal Company.

Delaware and Hudson Canal Company.—Coupons on registered loan of 1877.

Joliet Iron and Steel Company.—Coupons.

Milwaukee Iron Company.—The coupons on the bonds of this company are due during the present month.

Morris and Essex Railroad.—Coupons paid by the Delaware, Lackawanna and Western Railroad Company.

Oswego and Syracuse Railroad.—Interest on the 1st mortgage bonds of 1875 paid by the Delaware, Lackawanna and Western Railroad Company.

Rensselaer and Saratoga Railroad.—Coupons paid by the Delaware and Hudson Canal Company.

Richmond Iron Mining Company. The interest on the bonds of this company will be due on the 15th inst.

St. Louis and Iron Mountain Railroad.—The coupons on the bonds of this company are due during the present month.

Warfield Coal and Salt Company.—The coupons on on the bonds of this company are due during the present month.

Wilmington Coal Mining and Manufacturing Company.—The coupons on the bonds of this Company are due during the present month.

Quotations and Sales of Stocks and Bonds.

For the week ending Nov. 3, 1876.

STOCKS.

	Highest	Lowest	Closing	Shares sold.
Pennsylvania Coal Co	—	—	*220	
Consolidation Coal Co	34	32¾	33	250
Spring Mt. Coal Co	—	—	†60	—
American Coal Co	—	—	*54	—
Maryland Coal Co	—	—	19½	100
Del., Lack., and West. RR. Co.	76	74⅜	74⅛	117,408
New Jersey Central RR. Co.	38	36¾	36¾	35,197
Delaware and Hudson Canal Co.	74	74	73	3,822
Quicksilver Mining Co. pref'd	—	—	16	—
" " " Common	—	—	13	500
Mariposa Land & Min. Co. pref'd	6½	5½	4¾	300
St. Louis & Iron Mountain RR.	13	12½	13	370
Total Shares sold				157,947
Sales for the week previous				131,948
Increase				25,399

* Nominal. † Asked,

BONDS.

	Inter'st	Sales.	Price.
Del., Lack. & West. 2d M	M. & S.	5,000	@109½
" " " 7's Con'ble	J. & D.		@105
Cent'l RR. of N.J., 1st M, New	F. & A.	1,000	@109
" " " 1st Cons.		17,000	86¼@ 87½
" " " Convert'le	M. & N.	32,000	86¼@ 89¼
Lehigh & W.-B'e, Con. Guar'd.		3,000	69 @ 69½
Am. Dock & Imp. Mt. Bonds	J. & J.	3,000	@ 77
Del. & Hud. Can., 1st M., 1891		11,000	@108
" " " 1884			@105
" " " 1877			@104
" " " Coup. 7's, 1894		4,000	@ 98
" " " Reg'd 7's, 1894			@
St. L. & Iron Mountain, 1st M	F. & A.	9,000	100 @100½
" " " 2d M	M. & N.		@ 70
Chesapeake & Ohio 6's, 1st M.		32,000	29 @ 30
" " Ex. Coupon			@ 20
Mariposa Gold Loan con. 7s			@100⅜
Total sales		$117,000	

Closing quotations, in the absence of sales, represent the latest prices bid.

Philadelphia Stocks.

PHILADELPHIA, Thursday Evening, Nov. 2, 1876.

The occurrence of a holiday on the 27th ult., and but a partial day's business on the 28th ult., coupled with an apparent disposition on the part of operators to hold off from speculative ventures until after the election, has had the effect of reducing the transactions and creating a generally dull market during the period intervening between our last report. The total sales amount to about 91,000 share, and 4 per cent. will represent the extreme difference in any of the quotations.

Pennsylvania Railroad.—46,535 shares of this stock have changed hands, the stock closing at an advance This company announces a quarterly dividend of two per cent. or one dollar per share, being at the rate of eight per cent. per annum, payable on the 26th. It is stated on good authority that the company will be enabled to pay dividends on its stock for one year, including the present quarter, out of the earnings of the Centennial passengers alone. The receipts and profits of the main line are far beyond anything ever before experienced in its history.

Reading Railroad.—About 33,000 shares comprises the sales in this stock for the week, and 22¾@25 the extreme quotations, the closing quotation of 23 being equal to a decline of 3⅛ per cent. With regard to the grain transportation business of this company, it is stated that instead of bringing its grain forward over the Erie and Lehigh Valley Roads, as at first proposed, it has recently received some cargoes via the Northern Central, taking them at Williamsport and thus securing their transportation over the whole of its road, instead of paying other roads to do the hauling, and looking for its own profit to the wharfage and elevator facilities alone. It is said the new programme owes its origin to the action of the Lehigh Valley Company when the Coal Combination broke up. The company has remodeled some of its Richmond pockets to receive and discharge grain. The quantity of iron puddled in the mill of this company has been doubled since the experimental use of coal dirt. The company has commenced the use of gas in the cars running on the Shenandoah branch. This will be a decided improvement on the present arrangement. It is in contemplation to equip the train with air brakes in the near future. Thirty-one collieries belonging to this company are now in motion.

Wilmington and Reading Railroad.—The sale of this railroad, under foreclosure of mortgage, has been definitely fixed for the first Monday in December.

Lehigh Coal and Navigation Company.—This stock has been comparatively active during the week, and closes at a fractional decline. The sales aggregate over 10,000 shares. It is stated that the short interest in this stock is very large.

Coupons and Interest are due on the bonds of the following during the present month:

Delaware and Raritan Canal Company.—Coupons paid by the Pennsylvania Railroad Company.

Karthaus Coal and Lumber Company.—Coupons.

Lehigh Coal and Navigation Company.—Interest on the registered 6 per cent. loan of 1897.

North Pennsylvania Railroad.—Coupons on the second mortgage 7 per cent. bonds.

Pennsylvania Railroad.—United Company's loan due in 1899, coupons; first mortgage 7 per cent. bonds of 1896 coupons.

Schuylkill Navigation Company.—Boats, car loans, and improvement bonds, coupons.

Shickshiney Coal and Iron Company.—Coupons.

Union Canal Company.—Coupons on the first mortgage bonds.

Camden and Amboy Railroad.—Interest on the mortgage bonds of this company matures during the present month, and is payable at the office of the Pennsylvania Railroad Company.

Philadelphia and Reading Coal and Iron Company.—Interest on the 7 per cent. bonds of 1892-93.

Oil Creek and Allegheny River Railroad—Semi-annual interest matures on the consolidated 7 per cent. bonds of this company.

Philadelphia and Reading Coal and Iron Company.—We note an auction sale of $1,000 of the 7 per cent. mortgage bonds of this company (Big Mountain Tract) at par.

Cattawisa Railroad Company.—100 shares of the common stock of this company sold at auction during the week at $9 per share.

Quotations and Sales of Stocks and Bonds.

For the week ending Nov. 2, 1876.

STOCKS.

	Highest	Lowest	Closing	Shrs
Lehigh Valley RR. Co.	49⅞	49½	49⅞	321
Pennsylvania RR.	49⅞	48⅜	47⅞	47,535
Reading RR.	25	22¾	23	33,362
Lehigh Coal and Nav. Co.	31½	30⅞	31	10,069
Penn. Canal	—	—	*9	—
Buck Mountain Coal Co.	—	—	*25	—
Fulton Coal Co.	—	—	*3½	—
Locust Mountain Coal Co	—	—	—	—
Westmoreland Coal Co	—	—	*85	—
St. Nicholas Coal Co	—	—	*1	—
Cambria Iron Co	—	—	*16	—
Crane Iron Co	—	—	*25	—
Emaus Iron Co	—	—	—	—
Pennsylvania Salt Manufact. Co.	—	—	65	59
Total shares sold				91,287
Sales for the week previous				94,989
Decrease				3,702

* These quotations are nominal.

BONDS.

	Sales.	Price
H. and B. T. RR. 1st mortgage, 7s	$ —	@107
" " " 2d "	—	@102
" " " 3d " cons	—	@ 38
Lehigh Valley RR. Con. mtg. 6s	30,000	@100
" " " 7s, 1910	1,000	@112
" " " 6s Reg.	—	@108½
" " " 6s coup.	—	@108
Pennsylvania RR. 1st mtge. 6s	5,000	106¾@107
" " gen. " con. 1910	4,000	105½@107
" " gen. " 7s, reg.	—	@104
" " Cons. M. 6s reg.	—	@100½
Phil. & Reading RR. Con. M. 7s Reg.	4,000	@103
" " " G. M. 7s, coup.	—	@105
" " " Gen. M. 7s reg.	—	@103
" " new convertible 7s	4,300	73½@75
" " 6s '43.80	—	@103
" " Cons M.7s coup.	17,000	102 @103½
" " debenture 6s	—	@ 65
Phil. & Reading C. & I. Co. Deb. 7s	—	@ 69
" " Tamaqua tract.	—	@ 66
Lehigh Coal & Nav. Co., 6s '84	22,000	101½@102
" " " RR. 6s, '97	—	@101¼
" " " con. 7s	1,000	@ 90
" " " 6s gold loan	3,500	@100¾
" " " Conv. gold loan	—	@102
Penn. Canal, 6s	2,000	@ 72
Penn. and N. Y. Canal, 7s	1,000	@111½
Ches. and Del. Canal, 6s	—	@ 85
Susquehanna Canal, 6s	—	@ 68
Delaware Division Canal, 6s	—	@—
Susquehanna Coal Co. 6s	—	@ 77
Buck. Mount Coal Co. 6s	—	@—
Penn. Gas Coal Co. 6s	—	@—
Honeybrook Coal Co. 7s	—	@—
Total amount of sales	$94,800	

Closing quotations, in the absence of sales, represent the latest prices bid.

Copper Stocks.

Specially reported by Messrs. WILSON W. FAY & CO., Bankers and Brokers, Room 7 Traveller Building, 31 State Street, Boston.

BOSTON, THURSDAY EVENING, Nov. 2, 1876.

The market closes to-night very dull, and, with one or two exceptions, heavier. Calumet is steady, and holds its own well at 171 bid, a gain of 50c. per share. Allouez has been offered this week at 11½, and 10 is the bid, without sales. Copper Falls, for some unaccountable reason, is particularly weak, 3¾ (the best bid offered) to 4.50. Duncan Silver a trifle stronger, at 11¾ bid. International, 1 3-16 bid, with sales at 1¼. Quincy is very quiet, at 48½ bid. National is in fair demand, at from 2¼ to 2¾. The volume of business has greatly fallen off. Copper is lower. We hear of sales being made at 20½. This, together with our political excitement, tends to make the market dull, and a dull market invariably means lower figures.

Gold and Silver Stocks.

AMERICAN MINING BOARD.

NEW YORK, FRIDAY EVENING, Nov. 3, 1876.

THE transactions in gold and silver stocks during the past week have amounted to about 42 000 shares; this is a decrease of over 14,000 shares as compared with the business of the previous week.

We note that the questionable transactions in Grant mining stock, to which we alluded a few weeks ago, still continue, though at a more modest scale. The price which was then quoted at $7, fell to about $2.65 per share, and this past week have varied from $3 to $4 12½. As the sales are mostly fictitious, and the mine is wholly undeveloped, these figures are no criterion whatever of the actual value (if it has any) of the stock. Sales, which a few weeks ago were quoted at over 12,000 shares, have fallen to 5,400 for the past week, and it is generally understood that but few of these are *bona fide*.

Now that the questionable transaction has been explained, investors should be able to take care of themselves; but the influence on the new Mining Stock Board is very injurious, as we have had occasion to know. It is to be hoped that the Board will endeavor to prevent similar cases in the future, and so encourage the investment of capital in mining securities. These transactions have a directly opposite effect.

From our weekly review of the condition of the mines, we note that the present output of the bonanza mines, California and Consolidated Virginia on the basis of their product for the first three weeks in October, scarcely attains the rate of $50,000 per day; this would equal an aggregate yield for the month of October of about $1,550,000. It would require an additional sum of $510,000, which would have to be drawn from the surplus accounts of two companies, to make up the deficiency in the amount necessary to pay the November dividend, at the usual rate of $2 per share. The Justice Mine is producing very rich ore from the 400 and 600-feet levels, the average assays in some parts excelling those of the present run of the bonanza ore. The impression seems to prevail that the general market for mining stocks will not improve much before next Spring. The continued levying of assessments, and the small returns from the dividend mines acts against a general rise in this class of securities, and outside of the probable maintenance of the quotations of the bonanza stocks, and also of those mines which are yielding well or where important discoveries have been made, the general list tends downward.

Merrimac Silver Mining Company—The quotations of this stock are well maintained, sales for the week amount to 550 shares. This company has declared its regular monthly dividend of $1 per share, payable in Boston on the 10th inst.

Bobtail Gold Mining Company, Colorado. The mill product of this company for the month of September was 1,356 ounces of gold, worth about $27,900 currency.

The New York Mining Company will hold its annual meeting on the 6th inst.

Below we give information from our exchanges regarding the condition of a number of mines up to the 25th ultimo:

Consolidated Virginia.—Daily yield, 450 tons of ore. The ore stopes on the 1400 and 1550-feet levels are looking finely. Especially is this the case with the ore stopes going north on the 1400-feet level. About 45 feet in width of these stopes is to-day yielding ore, which for richness was never exceeded by any considerable body of ore yet extracted from the mine. On the 1700-feet level the north drift is again steadily advancing, though slowly. The heat in the face is intense. Additional blowers are being put in to furnish a better supply of air, and drive the drills. At the 1650-feet station of the C. and C. shaft, the west drift to cut the ore vein is now drained perfectly dry, and is being pushed ahead with all the speed possible to reach the ledge. The mills are all kept steadily running up to their full crushing capacities. A large new ore dump is being constructed at the C. and C. shaft, and the side switch of the Virginia and Truckee Railroad will be completed to the shaft in a very few days more, ready to commence the shipment of ore as soon as the ledge is reached. For the three weeks ending October 21st 8,022 tons of ore were extracted from this mine, and if this is the amount from which the bullion for the current month to the same date is produced, which amounts to $500,172, its value would average $62 35 per ton.

California.—Daily yield, 450 tons of ore. The ore stopes on the 1500 and 1600-feet levels are yielding splendid ore. On the 1500-feet level the ore breasts between crosscuts Nos. 5 and 6 are exposed directly across the vein, an opening drift being kept a few yards in advance. The breasts and this drift, which is now 30 feet in advance without yet having reached the wall, already have opened the vein to the magnificent width of 230 feet. How much wider it is at that point yet remains to be seen. The main south drift on the 1600-feet level is

MINING STOCKS.

AMERICAN MINING BOARD'S LIST.

Name of Company.	Location.	Feet on Vein.	Capital Stock.	*a* No. of Shares.	Total Assessments Levied.	Date and Amount of Last Assessment per share.	Total Dividends paid.	Date and Amount of Last Dividend per share.	Closing Quotations *g* American Currency. Sat.	Mon.	Tues.	Wed.	Thurs.	Fri.	Shares sold during the week.
Alpha Cons. G. S.	Nevada,	300	$ 3,000,000	30,000	$180,000	Aug. 12, '75, $1.	....	.....	$49 50	$48 75	$49 00	$50 50	$49 25	$45 00	650
Belcher, G. S.	Nevada,	1,040	10,400,000	104,000	660,400	April 14, '71, $4.	$15,397,200	April 10, '76, $1.	*21 50	19 50	19 75	19 00	....	*19 00	5·0
Best and Belcher, G. S.	Nevada,	545	10,080 00?	100,800	136,192	July 13, '74, 50c.	....	.....	54 00	53 00	....	52 75	*50 00	51 00	8.6
Bullion, G. S.	Nevada,	943½	10,000,00?	100,000	2,054,000	Sept. 22, '76, $2.50.	....	.....	....	....	....	9 50	35 00	....	.....
Caledonia, G. S.	Nevada,	2,188	10,000,000	100,000	1,210,000	Aug. 28, '76, $1.00.	....	.....	....	11 62½	....	11 00	*12 50	10 75	1010
California, G. S.	Nevada,	600	54,000,000	540,000	....	.....	6,480,000	Oct. 16, '76, $2.	*65 50	*65 00	....	65 75	*65 00	62 25	60
Centennial, G.	Califor.	66 acres	1,000,000	100,000*b*	**	.....	....	.....	....	....	....	3 50	....	....	100
Chollar Potosi, G. S.	Nevada,	1,460	2,800,000	28,000	1,282,000	June 26, '76, $5.	3,080,000	Feb. 10, '72, $1.	87 75	....	87 25	90 00	*92 00	....	230
Cleveland, G.	Colo.	3,715	250,000	25,00.*b*	....	.....	....	.....	9 00	9 00	9 00	9 12½	9 12½	9 12½	4,430
Cons. Hercules & Roe, S	Colo.	10,500	1,000,000	100,000	**	.....	120,00.	.....	*0 00	*0 00	0 00	5 87½	5 87½	5 87½	1,010
Cons. Imperial, G. S.	Nevada,	468	50,000,00	500,000	125 00	July 25, '76, 25c.	....	.....	3 87½	4 25	4 62½	4 50	....	3 50	1,200
Cons. Virginia, G. S.	Nevada,	710	54,000,00.	540'000	411,200	June 11, '73, $3.	23,760,000	Oct. 11, '76, $2.	*63 50	*1 00	....	60 00	*59 50	54 00	40
Confidence, G. S.	Nevada,	130	2,496,000	24,963	243,840	March 18, '73, $1.	78,000	May 1, '65, $8. 33⅓	*13 00	....	....	....	....	*17 00	....
Crown Point, G. S.	Nevada,	600	10,000,020	100,000	1,073,370	Aug. 15, '76, $1.	11,588,000	Jan. 12, '75, $2.	*15 50	12 25	13 00	12 50	....	10 00	700
Eureka Cons. G. S. L.	Nevada,	..	5,000,000	50,000	100,000	May 26, '76, $1.	1,000,000	Aug. 5, '75, $1.	....	....	....	....	....	....	....
Exchequer, G. S.	Nevada,	400	10,200,000	100,000	280,000	Sept. 22, '76, $1.	....	.....	16 25	17 25	*20 00	16 75	*17 50	14 00	510
Gould and Curry, G. S.	Nevada,	621	10,800,000	108,000	2,018,00	Aug 11, '79, $1.	3,826,800	Oct. 10, '70, $10.	16 25	16 62½	*17 37½	*7 50	16 25	*17 37½	550
Grant, G. S.	Nevada,	1,000	10,000,000	100,000	....	.....	....	.....	3 00	3 25	3 00	3 62½	4 12½	4 00	5400
Hale & Norcross, G. S.	Nevada,	400	11 200,000	112,000	2,247,000	Oct. 10, '76, $1.	1,598,000	April 10, '71, $5.	9 75	9 00	9 00	9 00	8 50	9 25	27 0
Hukill, S.	Colo.	3,088	1,000,000	10,000	**	.....	10,000	$1	....	....	....	....	....	....	.....
Indian Queen, S.	Nevada,	1,000	3 000,000	60,000	....	.....	60,000	.....	7 25	....	....	....	....	*7 00	.....
Julia Cons. G. S.	Nevada,	3,000	11,000,00	110,000	110,000	Sept. 11, '76, $1.	....	.....	7 75	8 12½	*8 00	7 00	7 00	*10 00	650
Justice. G. S.	Nevada,	2,100	10,500,00.	105,500	1,502,500	Sept. 14, '76, $5.	....	.....	28 00	28 00	27 25	26 75	*27 75	*28 00	1100
Kentuck, G. S.	Nevada,	95	3,000,000.	30,000	270,000	Dec. 3, '74, $1.	1,252,000	March 8, '70, $5.	....	15 75	*15 00	12 50	11 00	13 00	380
Kossuth, G. S.	Nevada,	2,700	5,400,000	108,0000	403,000	Aug. 15, '76, 50c.	....	.....	2 00	.....	*2 75	1 25	....	....	300
Leopard, G. S.	Nevada,	1,500	5,00 .00.	50,000	50,000	March 31, '76, $1.	112,500	Oct. 16, '76, 50c.	7 25	*11 00	*8 00	*8 75	*9 50	*8 87½	.....
Luzerne Mining Co.	Colo.	4,200	5,000,000	500,000	**	.....	....	.....	....	1 37½	1 37½	1 12½	1 37½	1 25	2250
Mer. and Min. Tun. Co.	Colo.	30,000	500,000	50,000	**	..	....	.....	....	....	....	4 75	4 75	5 00	1900
Mexican, G. S.	Nevada,	600	10,030,00	100,800	100.80	Sept. 5, '76, 50c.	....	.....	40 00	....	....	38 00	41 50	40 50	550
Merrimac, S.	Mass.	1,500	500,000	5,000	**	.....	5,00c	Oct. 10, '70, $1.	33 25	31 37½	29 00	31 00	*31 00	*31 75	950
Morning Star.	Nevada,	1,600	8,000,000	8 ,00	....	.....	....	.....	....	....	....	....	....	....	.....
Northern Belle, S.	Nevada,	1,600	5,000,000	50,000	....	.....	850,000	Oct. 16, '76, $1.	....	*.8 37½	*30 00	30 75	*30 00	*30 87½	200
Ophir, G. S.	Nevada,	675	10,080,000	100,8 .0	2,034,400	May 14, '75. $2.	1,394,400	March 9, '04, $4.	55 37½	55 75	54 00	58 00	54 25	*56 75	1340
Original Comstock, G. S.	Nevada,	....	10,000,000	10,000	....	.....	....	.....	1 25	1 75	1 50	*1 75	....	2 87	2000
Overman, G. S.	Nevada,	1,200	3,840,000	38,40.*b*	2,222,28	Oct. 21, '76, $3.	....	.....	*92 50	....	....	93 00	91 87½	....	1·0
Pleasant View.	Colo.	1,200	200,000	20,000	**	.....	....	.....	1 62½	1 50	1 37½	1 37½	1 37½	*1 62½	120
Raymond and Ely, G. S.	Nevada,	5,000	3,000,000	30,000	510,000	Nov. 5, '75. $3.	3,075,000	Sept. 10, '73, $3.	4 50	*5 50	5 50	5 00	6 75	....	200
Santiago, G. S.	Nevada,	2,000	11,200,000	112,000	....	.....	....	.....	11 75	....	....	....	.. .	....	.....
Savage, G. S.	Nevada,	800	11,200,000	112,000	2,746,000	May 31, '76. $2.	4,460,000	June 11, '69, $3.	16 25	15 62½	16 12½	15 37½	14 75	*15 00	2430
Sav. Belcher, G. S.	Nevada,	163	640,00	6,400	244,800	April 11, '76, $5.	....	.....	....	....	....	....	*30 00	....	.....
Sierra Nevada, G. S.	Nevada,	3,650	10,000,000	100,000	1,500,000	Oct. 25, '76, $1.	102,500	Jan. 16, '71, $1.	....	13 00	*14 00	13 50	*13 75	14 00	700
Silver City, G. S.	Nevada,	3,900	6,310,000	63,100	....	.....	....	.....	*1 75	1 75	1 25	....	1 50	1. 87½	950
Silver Hill, G. S.	Nevada,	5,400	10,800,000	108,000	810,000	Sept. 18 '76, $1.	....	.....	*17 00	....	*12 25	11 00	11 50	....	100
South Comstock, G. S.	Nevada,	1,500	10,000,000	100,000	44,000	May 3, '76, 10c.	....	.....	....	....	....	....	....	....	.....
South. California, G. S.	Nevada,	1,500	5,000,000	50,000	....	.....	....	.....	....	....	..	....	....	....	.....
Southern Star, G. S.	Nevada,	1,500	6,000,000	600,000	....	.....	....	.....	1 50	1 75	1 62½	....	1 75	2 25	2700
Trenton, G. S.	Nevada,	..	10,000,00.	100,000	....	.....	....	.....	....	....	....	....	....	....	.....
Union Cons. G. S.	Nevada,	850	10,000,000	100,000	260,000	March 3, '76, $1.	....	.....	*17 00	15 00	13 50	14 00	10 50	12 00	510
West Belcher, G. S.	Nevada,	1,000	10,000,000	100,000	....	.....	....	.....	....	....	....	....	....	....	.....
Yellow Jacket, G. S.	Nevada,	1,200	12,000,000	120,000	2,598,000	July 18, '76, $1.	2,184,000	Aug. 10, '71, $2.50.	29 37½	26 75	26 25	24 37½	22 50	21 00	940
Young America, S.	Nevada,	1,020	3,000,00.	30,000	6,000	Oct. 23, '76, 20c.	....	.....	....	....	....	....	1 00	....	200
			Assessments levied to date, $27,432,78			Div'ds pd. to date, $82,103,400								Total sales.....	42,050

BOSTON STOCK MARKET.

									Fri.	Sat.	Mon.	Tues.	Wed.	Thurs.	
Allouez, C.	Mich.	..	$1,000,000	20 000	$940,000	May 9, '76. $5.	....	.....	$ 0 00	10 00	10 00	10 00	10 00	10 00	.....
Calumet and Hecla, C.	Mich.	2¾ mile	2,000,000	80,000*d*	1,200,000	.....	$11,050,000	Oct. 21, '76, $5.	170 50	170 00	170 00	170 50	171 00	....	.....
Central, C.	Mich.	..	500,000	20,00 *c*	100,000	June, '62, 65c.	1,020,000	Feb. 17, '76, $5.	35 00	35 00	35 00	35 00	35 00	35 00	.....
Copper Falls, C.	Mich.	..	1,000,000	20,000*d*	535,00.	May 10, '76,	100,000	Nov., '71, $1.	5 00	4 87½	4 75	4 50	4 00	3 75	.....
Dana, C.	Mich.	..	500,000	20,000*d*	68,000	Jan., '7, 50c.	....	.....	13	13	13	13	13	13	.....
Dawson, S.	Canada.	..	1,200,000	60,000*f*	....	.....	.. ..	.....	23	23	22	20	20	20	.....
Duncan, S.	Canada.	..	1,200,000	60,000*f*	75,000	July, '76, 41⅔.	....	.....	11 12½	11 12½	11 25	11 25	11 37½	11 62½	.....
Franklin, C	Mich.	..	500,000	20,000*d*	364,000	June, '68, $5.	585,000	Nov., '71, $1.	14 25	14 25	14 12½	14 00	14 00	14 00	.....
Humboldt, C.	Mich.	..	500,000	20,000*d*	100,000	Sept. 28, '76, 15c.	....	.....	15	15	15	15	15	14	.....
International, S.	Canada.	..	1,200,000	60,000*f*	....	.....	....	.....	94	94	94	94	1 25	94	.....
Madison, C.	Mich.	..	50 1,000	20,000*d*	123,000	Sept. 11, '74, 10c.	....	.....	30	30	30	30	30	30	.....
Mesnard, C.	Mich.	..	500,000	20,000*d*	160,000	April 12, '65, 50c.	....	.....	40	40	40	40	40	25	.....
Minnesota, C.	Mich.	..	1,000,000	20,000*d*	436,000	June 10, '69, $1.	1,820,000	Mch. 15, '76, 50c.	1 75	1 62½	1 75	1 50	1 37½	1 00	.....
National, C	Mich.	..	500,000	20,000*d*	195,000	Oct., '75, $1.	360,000	Oct., '73, $1.	2 37½	2 25	2 25	2 25	2 12½	2 12½	.....
Osceola, C.	Mich.	..	1,000,000	40,000*d*	840,000	May 1, '76, $2.	....	.....	19 00	18 00	17 00	18 00	18 50	19 00	.....
Petherick, C	Mich.	..	500,000	20,000*d*	165,533	March 22, '76, 50c.	....	.....	62	62	60	60	55	55	.....
Pewabic, C	Mich.	..	500,000	20,000*d*	185,000	June, '68, $3.	460,000	July, '73, $1.	4 25	4 25	4 12½	4 12½	4 00	4 00	.....
Phenix, C.	Mich.	..	1,000,000	20,000*d*	817,500	Sept., '70, $3.	....	.....	....	....	....	....	....	....	.....
Quincy, C.	Mich.	..	*h* 200,000	20,000*b*	....	.....	2,050,000	Oct. 28, '76, $3.	48 00	48 25	49 00	49 00	48 50	48 50	.....
Ridge, C	Mich.	..	500,000	20,000*d*	....	.....	....	.....	6 00	6 00	5 87½	5 75	5 50	6 00	.....
Rockland, C	Mich.	..	500,000	20,000*d*	495,000	Jan., '74, $1.	....	.....	30	30	30	30	30	30	.....
Star, C.	Mich.	..	500,000	20,000*d*	265,000	March 30, '76, 50c.	....	.....	37	37	37	37	37	37	.....
Superior, C.	Mich.	..	500,000	20,000*d*	340,000	March, '74, 25c.	....	.....	12⅛	12⅛	12⅛	12⅛	12⅛	12⅛	.....
			Assessments levied to date, $7,440,033			Div'ds paid to date, $23,445,000								Total sales.....3,500 shares.	

G. Gold. *S.* Silver. *L.* Lead. *C* Copper. *a* The par value of shares is $100, unless otherwise designated. *b* Par value $10. *c* Par value $50. *d* Par value $25 each. *e* Par value $15. *f* Par value $20. *g* Closing quotations represent the latest prices bid. Prices asked will have a * affixed. *h* Full paid. *i* On the four old companies. ** Not Assessable.

steadily advancing through the center of the ore-vein, the face still in rich ore. This drift is making about 2 feet per day, and shows the ore vein to be a solid mass of rich pay ore as far as it has yet penetrated. The drifts and winzes on the 1300 and 1400-feet levels are all being put in the best possible repair The mills are crushing the ore as fast as it is extracted. Sinking the C. and C. shaft is making the usual progress, the flow of water at the bottom being strong, and keeping the pumps busy from the 1st. The ore yield of this mine from the 1st to the 21st ult., was 8,907 tons and the bullion returns $539,052; the result is $60 52 to the ton.

Justice.—Daily yield 160 to 165 tons of ore. The ore stopes are looking well at all points. The upraise in the ore body from the stopes on the 400-feet level is showing a fine body of ore which will yield from $60 to $80 per ton. The development of the ore body downward below the 600-feet level is proving it to be rich in stephanite and ruby silver, some of the choice pieces fairly glittering with the precious metals. On the 800-feet level a winze has been started in the ledge between crosscuts Nos. 2 and 3, the bottom of which yielding ore that assays rich in gold. The ore in the face of crosscut No. 4 on that level is showing a steady improvement in quality. Crosscuts Nos. 1, 2 and 3 on that level are steadily advancing in ledge matter of a highly encouraging character. The northeast crosscut on the 1000-feet level is advancing as usual, the face in ledge formation. The main southeast drift on the 1000-feet level is being steadily pressed ahead to cut the ore vein. The pumps are handling the water with ease.

Yellow Jacket.—On the 2040-feet level a crosscut has been started to the westward at a point 100 feet south of east crosscut No. 1. Sinking the south winze below the 1040-feet level is making good progress. The north drift on the 1940-feet level, running to connect with the Imperial Mine, is being pushed rapidly ahead. The grading has been completed from the railroad to the site of the new shaft, ready for a switch or side-track, which will be built by the railroad company at once. This will enable the delivery of the necessary supplies directly at the shaft, saving all cost of rehauling. It has been decided to use the Chipman shaft, which has two compartments and is down 100 feet in depth. This will be quite a start for the shaft.

Ophir.—Daily yield, 300 tons of ore The ore breasts show little if any change during the week. The north and south prospecting drifts on the 1650-feet level are steadily advancing, and are both looking more favorable for good ore developments than at any time in the past. Sinking the main incline is going rapidly ahead. The north drift on the 1700-feet level is steadily advancing, the face in very favorable ground. The ore dump at the head of the main incline is about completed. Sinking the main incline below the 1700-feet level will be commenced in a very short time. Every thing is in good shape for a steady, profitable Winter's work.

Belcher.—Daily yield, 300 tons of ore. No change in any of the ore-producing sections of the mine. The main south drift on the 1500-feet level is making steady progress, the face in very favorable ledge matter. The main south drift on the 1600-feet level is in a distance of 471 feet, the face also in very encouraging ground. The new pumping engine seems, so far as tried, to be all that was expected of it. The air and drain shaft, to connect with the south drift from the Crown point on the 1700-feet level, is completed.

Bullion.—The east crosscuts on the 1400 and 1500-feet levels are steadily advancing, the face of each being in ledge matter of a highly encouraging description. The east crosscut on the 1600-feet level is also steadily advancing toward the ore vein. A south drift is being run from this crosscut to connect with the main incline for air purposes. The north drift on the 1700-feet level is steadily following the west clay wall of the ledge, the face in quartz, clay and porphyry, mixed with encouraging ore prospects.

Julia. The main south drift on the 1600-feet level is steadily advancing, the face still in quartz and low grade ore. This ore development so far to the south and east, the face of the drift being about 670 feet south of the shaft, is one of much value, and proves a concentration of the ore vein much farther to the south and eastward than was ever expected at that depth. The south drift on the 1800-feet level steadily advancing along the east wall of the ledge, the face in clay and porphyry, mixed with lively looking quartz.

Chollar-Potosi.—Daily yield, 100 tons of ore, the average assay value of which is $32 per ton. Sinking the main incline is making steady and fair progress. The pumps are kept running about three-fourths of the time. The new hoisting machinery at the Combination shaft is completed, ready for use.

Overman.—Sinking the main shaft is being pushed ahead at a very favorable rate, the speed attained being about 2½ feet per day. The immense new pumping beam is in place and the erection of the entire pumping machinery is fast approaching completion. The north and south drifts on the 1,200-feet level are being driven ahead. the face of each drift being in a very favorable quartz formation.

Crown Point.—Sinking the main incline below the

1,800-feet level is making splendid progress. It is now down 1,880-feet. The south drift on the 1,700-feet level last Monday morning completed the connection with the combination Belcher air shaft, completely ventilating the mine on that level and opening a drain for the water into the Belcher pump shaft.

Best and Belcher.—The most important move that we have to record of this mine is the starting of a crosscut east a little north of the center of the claim on the 1,700-feet level. This crosscut will be driven in a distance of fifty feet, just far enough to make room for the use of the diamonds drills, which will then be used to prospect the ledge and drain the water if any be found in the vein.

Sierra Nevada.—The south drift from the 1,500-feet station is showing some very encouraging ore prospects. The north drift on that level shows a better character of quartz than has been encountered before in that direction. The drift on the 1,000 and 1,250-feet level are making the usual progress, without change of value to record.

Mexican.—The upraise on the 1,465-feet level is showing more quartz of a better character. It begins to look as if a body of pay ore might be yet found in the unprospected ground lying to the east of all the old workings above the 700-feet level. The drift recently started to the eastward on the 1,300 feet level is making steady headway toward the ore vein.

Alpha.—The laying of an iron track in the main incline of the Imperial shaft has stopped the hoisting of rock, and greatly interfered with the headway of the north drift on the 2,000-feet level during the week past.

Union Consolidated.—The east and west crosscuts from the north drift, on the 1,300-feet level, are each advancing in very favorable ledge matter. The west drift is showing spots of heal by looking quartz.

Savage.—The pumps are kept busy, and the water is gradually though slowly being lowered. Only about 30 feet of gain has been made during the week.

Sutro Tunnel.—Total length of tunnel from mouth to face of header on the 24th inst., 14,787 feet. The face is now in harder rock than last week, but blasting and working better, requiring less trouble in timbering and consequently allowing of faster advancement.—*Gold Hill News*, October 25.

Raymond and Ely.—The drift which is being run west on south vein, tenth level, has connected with the winze, and a good circulation of air has been established We are now engaged in prospecting at the points where the most favorable indications were observable. Along the line of this drift some little good ore is being extracted, but thus far the streak has proved very limited in extent. The drift being run west on the eleventh level has been extended twenty feet during the week The fissure still continues regular and well-defined, but appears to be making off to the north from its general course. The vein matter, concentrated, presents the same promising appearance as heretofore encountered, with considerable water oozing through the rock in the face of drift. The prospect work being prosecuted on the eighth level shows some very promising vein matter, but little ore of practical value. The smelting furnace at Bullionville will soon be completed, and if it proves a success, which we have every reason to believe it will, we can have our base ore reduced here, instead of shipping it to Sacramento, and save transportation on the waste material.—Pioche *Record*, Oct. 23.

INCORPORATIONS.

We note the recent organization of the following mining companies, in addition to the announcements in our issue of September 30th:

Name of Company.	Location.	Cap. Stock.
Equator Gold and Silver Mining Co.	Nevada,	$10,000,000
West Justice Mining Co.	"	4,000,000
Donald Gold and Silver Mining Co.	"	10,000,000
Cook & Gray Gold and Silver Mining Co.	"	10,00 ,000
Lord & Robinson Gold & Silver Min. Co.	"	15,000,000
Hornet Mining Co.	"	10,000,000
Plumas Gold and Silver Mining Co.	"	12,000,000
Plutus Gold and Silver Mining Co.	"	12,500,000
Loyal " " "	"	10,000,000
Washoe Water and Gravel Co.	"	2,500,000
Gen. Robert Allen Silver Mining Co.	California,	5,000,000
Occident Mining Co.	"	10,000,000
Seventy-six Gold and Silver Mining Co.	"	5,000,000
Feather River Mining Co.	"	1,000,000
Providence Hill Hydraulic Mining Co.	"	1,000,000
Sooner Mining Co.	"	1,000,000
Careless Tom Gold & Silver Mining Co.	"	5,000,000
North Modoc Mining Co.	"	10,000,000
El Paso Silver Mining Co.	"	10,000,000
Cerro Gordo Mill and Mining Co.	"	1,000,000
Cataract and Wide West Gravel Min. Co.	"	10,000,000
Montericharad Gold Mining Co.	"	96,000
California Crystal Oil Co.	"	100,000
Dolores Consolidated Mining Co	Cal. & Nev.,	10,000,000
Cerro Colorado Mill and Mining Co.	Arizona,	10,000,000
Hackberry Mill and Mining Co.	"	6,000,000
Champion Silver Mining Co.	Pac. Coast,	10,000,000
Algonquin Mining Co	Montana,	2,000,000
Forest City Mining and Smelting Co.	Utah,	750,000
Sinaloa Mining Co.	Mexico,	5,000,000
Six ux City and San Juan Mining Co.	Colorado,	630,000
Waltham Gold Mining Co., Cal., Nov. & Utah,		5,000,000

Gas Stocks.

NEW YORK, FRIDAY EVENING, Nov. 3, 1876.

A SLIGHT improvement is noticeable in the quotations of the Citizens', Metropolitan, and Peoples' Gas Companies of Brooklyn. New York stocks are very quiet, and generally tend to lower prices, otherwise no change has occurred as compared with our last.

The New York Gas Company has declared a cash dividend of 5 per cent., payable on demand. This is equal to a disbursement of $200,000 to its stockholders.

Brooklyn Gas Company.—This company announces a cash dividend of 5 per cent., equal to $200,000, payable on demand.

Montreal Gas Company.—We note recent sales of the stock of this company, amounting to 140 shares, at from 162¼ to 163 per share.

Peoples' Gas Light and Coke Company of Chicago, Ill. The coupons on the bonds of this company will be paid on presentation in New York.

Laclede Gas Company, Mo.—We note recent quotations of the bonds of this company at 95 and 97 per cent.

The Lima Ohio Gas Company's bonds were recently quoted at par.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad st., N. Y.

Companies in New York and Vicinity	Cap. Stk.	Par.	last Div.	When Paid.	Bid.	Askd.
			pr.c			
Mutual, N. Y.	$5,000,000	$ 100	2½	Jan. '76	109	110
" " Bonds	90,000	1,000	†3½	Feb. '76	100	110
NewYork, "	4,000,000		5	Nov. '76	135*	140
Metropol. "	2,500,000	100	5	Sep. '76	140	145
" " Certf.	1,000.000	....	3½	" "	102	104½
" " Bonds	500,000	1,000	3½	Jan. "	102	102½
Harlem "	1,850,000	50	4	Aug. '76	100	105
Manhattan"	4,000,000	50	10	July "	240	242
Brooklyn, B'klyn	2,000,000	25	5	Nov. '76	179*	181
Nassau "	1,000,000	25	4	Jan. '76	75	—
" "Certf.	700.000	1,000	3½	Nov. '76	95	—
People's "	1,000,000	10	3½	Jan. '76	50	55
" "Certf.	300,000	1,000	3½	July '76	88	90
" " Bds	325,000	....	3½	Aug. "		95
Metropol. "	1,000,000	10	3½	May. '76	76	80
Wmsburgh "	1,000,000	50	3	Oct. '76	130	—
" "Certf.	1,000,000	....	3½	July "	101	102½
Citizen's "	1,200,000	20	2½	Jan. '76	96	98
" "Certf.	320,000	1,000	3½	Oct. "	98	100
J. C. N.J.	386,000	20	5	July,'75	100	—
Centl. Westch. N.Y.	465,000	50	4	July. "	95	—
Suburb'n " "	390 000	50				90

* Ex-dividend of 5 per cent. † Gold.

COMPANIES OUT OF TOWN.

Companies out of Town.*	Cap. Stk.	Par	Bid	Askd
People's " " of J. C.			120	133
¶Citizen's G. L. Co., New'k. N.J.	1,095,000	50	95	100
Perth Amboy G. L. Co., N. J.		25		90
Hempstead " L. I., N.Y.	40,000	100		100
Jamaica " " "	25,000	100		100
Flatbush " " "			145	150
Richmond Co., S. I. "	300,000	50	97	100
Citizens', Rochester, "		100	45	50
Rochester Gas Co., "		100	50	
Central of "		50	95	100
‡People's G. L. Co. Albany,"	1,000,000	100		20
§Mutual " Buffalo "	750,000	100	50	60
Mutual " Detroit Mich.		50	18	
TroyG. L. Co., Troy, N. Y.			108	
Citizens " " "	600,000	100		100
Brockport, N. Y., G. L. Co.	25,000	100	60	80
Saugerties G. L. Co.	15,000	100	100	
‖Baltimore G. L. Co., Balt., Md	2,000,000	100	160	162
St. Louis G. L. Co., St.Louis, Mo	600,000	50	73	75
People's G. L. Co., Balt., Md	2,000,000	25	24	24½
Hannibal G. L. Co., Hanni., Mo.	100,000	100	95	100
La Clede, St. Louis, Mo	1,200,000	100	100	110
Lewiston G. L. Co., Lewis., Me	400,000	100	60	65
Chicago G. L. Co., Chicago, Ill.	2,000,000	100	115	120
Jacksonville, Ill.	120,000	100	82	
‡Lima, Ohio.	60.000	100	10	
Derby G. L. Co., Derby, Conn.	160,000	100	60	80
Woonskt G. L. Co.Woonskt, R.I.	150,000	100	100	
Fort Wayne G. L. Co. F. W., Ind		100	90	100
North. LibertiesG. L. Co. Phila.		25	29	
Wilkes-Barre G. L. Co W. B. Pa.		50	70	
Washington G. L. Co., Phila.			35	
Pottsville, Pa. Gas Co		50	40⅝	
Portland G. L. Co. Portland, Me	350,000	50	73	75
Hartford G. L. Co., Hartford, Ct	700,000	25	40	42
Boston G. L. Co., Boston, Mass.	2,500,000	500	800	820
East Boston, Mass.		25	30	33
South Boston, "		100	120	121
Brookline, "		100	116	120
Dorchester, "		100	100	100¼
Lawrence, "		100	119	120
Lynn, "		100	75	85
Salem, "		100	99	100
Chelsea G. L. Co. Chelsea, "	300.00		113	114
Cambridge G. L. Co., Cam., "	700,00		130	135
Louisville G. L. Co., Louis., Ky.			131	133
Cincinnati G. L. Co, Cincin. O.			195	196½
Mobile, Ala., Gas and Coke Co.			60	
Carondelet G. L. Co., Mo		50		15
S. F. G. L. Co. San Francisco, Cal	10,000,000	100	104½	105
Stillwater G. L. Co., Minn.	50,000	50		26
New Orleans "		100		124
City G. L. Co. Montreal, Can.	1,440,000	40	167	169
Consumers G. L (old.) Tor., Ont	600,000	50	134	
Hamilton G. L. Co., Ont.	150,000	40	112½	
Halifax G. L. Co., Halifax, N.S.	400,000	40		147½

* These quotations represent the latest obtainable prices at which sales were made.

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‡ This Company has $30.000 in bonds outstanding.

§ $200,000 represents the bonded indebtedness of this Company.

‖ $350,000 of the indebtedness of this company is represented by bonds.

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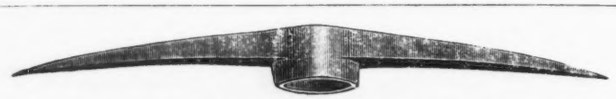

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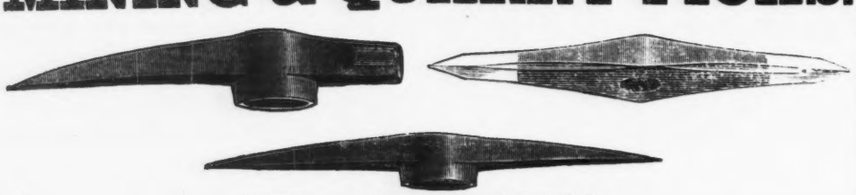

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